This document gives pertinent information concerning the reissuance of the VPDES Permit listed below. This permit is being processed as a Minor, Industrial permit. The discharge results from the operation of a 12 MGD water treatment plant. This permit action consists of updating the proposed effluent limits to reflect the current Virginia WQS (effective January 6, 2011) and updating permit language as appropriate. The effluent limitations and special conditions contained in this permit will maintain the Water Quality Standards of 9VAC25-260-00 et seq.

1.	Facility Name and Mailing Address:	Motts Run WTP 600 Hudgins Rd Fredericksburg, VA 22408	SIC Code :	4941 WTP
	Facility Location:	13000 Trench Hill Lane Fredericksburg, VA 22407	County:	Spotsylvania
	Facility Contact Name:	Richard Hall	Telephone Number:	(540)507-7300
	Facility Contact Title:	Water Treatment Manager		
2.	Permit No.:	VA0089460	Expiration Date of previous permit:	July 17, 2012
	Other VPDES Permits associated with this facility:		None	
	Other Permits associated with this facility:		PWSID #6177300 Air Registration Number 41010 AST ID 3037991	
	E2/E3/E4 Status:	Exemplary Environmental Enterprise Facility (E3)		
3.	Owner Name:	Spotsylvania County		
	Owner Contact:	Christopher Edwards	Telephone Number:	(540)507-7304
	Owner Contact Title:	Director, Water Production and Quality		
	Owner E-mail Address:	ctedwards@spotsylvania.va.us		
4.	Application Complete Date:	January 9, 2012		
	Permit Drafted By:	Alison Thompson	Date Drafted:	2/27/2012
	Draft Permit Reviewed By:	Joan Crowther	Date Reviewed:	3/26/2012
	WPM Review By:	Bryant Thomas	Date Reviewed:	4/3/2012
	Public Comment Period :	Start Date: May 4, 2012	End Date:	June 4, 2012

5. Receiving Waters Information:

Receiving Stream Name :	Motts Run Reservoir	Stream Code:	3-MOT
Drainage Area at Outfall:	Not Applicable	River Mile:	0.26
Stream Basin:	Rappahannock	Subbasin:	None
Section:	4c	Stream Class:	III
Special Standards:	PWS	Waterbody ID:	VAN-E19L
7Q10 Low Flow:	NA- discharge to lake	7Q10 High Flow:	NA- discharge to lake
1Q10 Low Flow:	NA- discharge to lake	1Q10 High Flow:	NA- discharge to lake
30Q10 Low Flow:	NA- discharge to lake	30Q10 High Flow:	NA- discharge to lake
Harmonic Mean Flow:	NA- discharge to lake	30Q5 Flow:	NA- discharge to lake
303(d) Listed:	Receiving Stream – Yes (Mercury in Fish Tissue)		
TMDL Approved:	Receiving Stream -No	Date TMDL Approved:	Due by 2020

6. Statutory or Regulatory Basis for Special Conditions and Effluent Limitations:

- ✓ State Water Control Law
- ✓ Clean Water Act
- ✓ VPDES Permit Regulation
- ✓ EPA NPDES Regulation
- ✓ EPA Guidelines
- ✓ Water Quality Standards
- ___ Other

7. Licensed Operator Requirements: VDH Requires a Class I Water Treatment Operator, No Wastewater Operator Requirements for this facility.

8. Reliability Class: Not Applicable

9. Permit Characterization:

- ✓ County
- ___ Federal
- ___ State
- ___ POTW
- ___ TMDL
- ___ Effluent Limited
- ✓ Water Quality Limited
- ___ Toxics Monitoring Program Required
- ___ Pretreatment Program Required
- ___ Possible Interstate Effect
- ___ Compliance Schedule Required
- ___ Interim Limits in Permit
- ___ Interim Limits in Other Document

10. **Wastewater Sources and Treatment Description:**

Motts Run Water Treatment Plant is a 12 MGD facility providing potable water for both to the City of Fredericksburg and Spotsylvania County. The facility draws water from two sources, the Rappahannock River and Motts Run Reservoir, with the Rappahannock River serving as the primary source.

The facility consists of chemical coagulation in two contact basins, two rapid mixers, four inline slow mixing chambers, four clarifiers, five filters and a clear well prior to final distribution. Backwash water from the filters and water from the floor drains and instrumentation flows to one of the two sedimentation basins. Solids are settled out and the supernatant is decanted to Motts Run Reservoir through Outfall 001.

See Attachment 1 for the NPDES Permit Rating Worksheet.
See Attachment 2 for a facility schematic/diagram.

TABLE 1 – Outfall Description

Outfall Number	Discharge Sources	Treatment	Max 30-day Flow	Outfall Latitude and Longitude
001	Filter pipe gallery and pump station floor drains; Backwash from five filters	See Item 10 above.	0.69 MGD	38° 18′ 37.06″ N 77° 32′ 33.25″ W

See Attachment 3 for (Salem Church, DEQ # 183D) topographic map.

11. Sludge Treatment and Disposal Methods:

The settled solids from the sedimentation basins are pumped to one of two sludge thickeners. Solids are then pumped into the sanitary sewer system and to the Fredericksburg WWTP (VA0025127) for treatment.

12. Discharges, Intakes, Monitoring Stations, Other Items in Vicinity of Discharge

TABLE 2	
3-MOT000.39	Ambient water quality monitoring station located 100 feet from Motts Run Reservoir Dam
3-MOT001.19	Ambient water quality monitoring station upper Motts Run Reservoir
3-RPP113.37	Ambient/trend monitoring water quality monitoring station on the Rappahannock River at the USGS cableway

The two public water supply intakes for Motts Run WTP are located within a 5 mile radius of this facility. One is located downstream of Motts Run on the Rappahannock River, and the other is located in Motts Run Reservoir.

13. Material Storage:

See Attachment 4 for a list of materials stored at the facility.

14. Site Inspection:

A site inspection was completed on February 22, 2012 (Attachment 5).

15. Receiving Stream Water Quality and Water Quality Standards:

a) Ambient Water Quality Data

The following is the summary for the lower segment of Motts Run Reservoir, as taken from the 2010 Integrated Report:

> There are two DEQ lake monitoring stations in the reservoir: 3-MOT000.39, Motts Run Reservoir is one hundred feet from the dam, and 3-MOT001.19 in the upper reservoir.
>
> The reservoir was listed as having a pH impairment, but was delisted with the 2010 cycle. It is not in the draft 2012 Integrated Report.
>
> The fish consumption use is categorized as impaired due to a Virginia Department of Health, Division of Health Hazards Control, mercury fish consumption advisory. According to the advisory, Largemouth Bass consumption should be limited to no more than 2 meals per month. Additionally, excursions above the risk-based tissue value (TV) of 300 parts per billion (ppb) for mercury (Hg) in fish tissue were recorded in tissue from one specie (largemouth bass) of fish sampled (6 total excursions) in 2006 at monitoring station 3-MOT000.39.
>
> Nutrient data collected during the 2003 and 2008 lake monitoring seasons shows that the aquatic life use, as evaluated by nutrients, is fully supporting. DO and pH data also show that the aquatic life use is fully supporting. The public water supply, recreation, and wildlife uses are considered fully supporting.

The full planning statement is found in Attachment 6.

b) Receiving Stream Water Quality Criteria

Part IX of 9VAC25-260(360-550) designates classes and special standards applicable to defined Virginia river basins and sections. The receiving stream, Motts Run Reservoir, is located within Section 4c of the Rappahannock River Basin, and classified as a Class III water.

At all times, Class III waters must achieve a dissolved oxygen (D.O.) of 4.0 mg/L or greater, a daily average D.O. of 5.0 mg/L or greater, a temperature that does not exceed 32°C, and maintain a pH of 6.0-9.0 standard units (S.U.).

Attachment 7 details other water quality criteria applicable to the receiving stream.

Ammonia:
The ammonia water quality standards are established using effluent and receiving stream pH and temperature data. The application provided limited temperature data for the effluent. A summer temperature of 33°C and a winter temperature of 1°C were provided. Effluent data from the monthly Discharge Monitoring Reports from December 2005 through November 2011 was reviewed and a 90th percentile pH of 6.8 S.U. was established. The effluent pH data can be found as part of Attachment 7.

Ambient monitoring from 2003, 2008, and 2009 in the Motts Run Reservoir yielded an annual temperature of 29.34°C. There are no data points from the winter, so a default temperature of 15°C was used. The 90th percentile pH was determined to be 8.9 S.U. The ambient pH and temperature data can be found as part of Attachment 7.

Metals Criteria:
The Water Quality Criteria for some metals are dependent on the receiving stream's hardness (expressed as mg/L calcium carbonate). The average hardness of the Motts Run Reservoir is 16.4 mg/L; this value was calculated utilizing five data points collected from the two DEQ ambient monitoring stations in the reservoir. The data is presented in Attachment 7. There is no new Total Hardness data for the effluent; therefore, the effluent value of 31 mg/L shall be carried forward from the previous permit. The hardness-dependent metals criteria are presented in Attachment 7.

Bacteria Criteria:
The Virginia Water Quality Standards at 9VAC25-260-170A state that the following criteria shall apply to protect primary recreational uses in surface waters:

1) *E. coli* bacteria per 100 ml of water shall not exceed a monthly geometric mean of the following:

	Geometric Mean[1]
Freshwater *E. coli* (N/100 ml)	126

[1]For a minimum of four weekly samples [taken during any calendar month].

c) Receiving Stream Special Standards

The State Water Control Board's Water Quality Standards, River Basin Section Tables (9VAC25-260-360, 370 and 380) designates the river basins, sections, classes, and special standards for surface waters of the Commonwealth of Virginia. The receiving stream, Motts Run Reservoir, is located within Section 4c of the Rappahannock Basin. This section has been designated with a special standard of PWS.

Special Standard PWS designates a public water supply intake. The Board's Water Quality Standards establish numerical standards for specific parameters calculated to protect human health from toxic effects through drinking water and fish consumption. See 9VAC25-260-140B for applicable criteria.

d) Threatened or Endangered Species

The Virginia DGIF Fish and Wildlife Information System Database was searched on January 9, 2012, for records to determine if there are threatened or endangered species in the vicinity of the discharge. The following threatened or endangered species were identified within a 2 mile radius of the discharge: Dwarf Wedgemussel, Bald Eagle, and Green Floater. The limits proposed in this draft permit are protective of the Virginia Water Quality Standards and protect the threatened and endangered species found near the discharge. The search is found in the reissuance file.

The stream that the facility discharges to is within a reach identified as having an Anadromous Fish Use. It is staff's best professional judgment that the proposed limits are protective of this use.

e) Mixing Zone Study for the Motts Run Water Treatment Plant

During the 2002 permit reissuance, a dilution factor of 12 was established to calculate WLAs; this study was done in accordance with 9VAC25-260-20B.10.b of the Virginia Water Quality Standards. The dilution factor was based on a study performed by Olver Laboratories (David Griffith, PhD.) on April 16, 2002 (Attachment 8). The study determined that the primary mixing zone is a cylindrical section of the reservoir lying in a horizontal plane near the surface. Based on visual observations, the diameter of the cylinder is on the order of four feet. The volume of the primary mixing zone is approximately 3,760 gallons. The zone of initial dilution was taken to a vertical cylinder, 40 feet in diameter with a depth of zero feet at the shoreline and 12.75 feet at its outermost perimeter. The volume of this zone of initial dilution is approximately 60,000 gallons. A weighted average dilution factor between the zone of initial dilution and the primary mixing zone was used to calculate the dilution factor. Staff has reviewed the study and this dilution factor will again be used to determine the WLAs and AWLAs for this reissuance.

16. Antidegradation (9VAC25-260-30):

All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The receiving stream has been classified as Tier 2 based on the fact that the receiving stream is a water supply reservoir. All public water supplies are assumed to be Tier 2 unless information is available to indicate otherwise (DEQ Guidance Memorandum 00-2001). At this time, there is no significant information available to indicate that Motts Run Reservoir not be considered a Tier 2 water. No significant degradation to the existing water quality will be allowed. In accordance with current DEQ guidance, no significant lowering of water quality is to occur where permit limits are based on the following:

- The dissolved oxygen in the receiving stream is not lowered more than 0.2 mg/L from the existing levels;
- The pH of the receiving stream is maintained within the range 6.0-9.0 S.U.;
- There is compliance with all temperature criteria applicable to the receiving stream;
- No more than 25% of the unused assimilative capacity is allocated for toxic criteria established for the protection of aquatic life; and
- No more than 10% of the unused assimilative capacity is allocated for criteria for the protection of human health.

The antidegradation policy also prohibits the expansion of mixing zones to Tier 2 waters unless the requirements of 9VAC 25-260-30.A.2 are met. The draft permit is not proposing an expansion of the existing mixing zone.

17. Effluent Screening, Wasteload Allocation, and Effluent Limitation Development:

To determine water quality-based effluent limitations for a discharge, the suitability of data must first be determined. Data is suitable for analysis if one or more representative data points is equal to or above the quantification level ("QL") and the data represent the exact pollutant being evaluated.

Next, the appropriate Water Quality Standards (WQS) are determined for the pollutants in the effluent. The WLA values are then compared with available effluent data to determine the need for effluent limitations. Effluent limitations are needed if the 97th percentile of the daily effluent concentration values is greater than the acute wasteload allocation or if the 97th percentile of the four-day average effluent concentration values is greater than the chronic wasteload allocation. Effluent limitations are based on the most limiting WLA, the required sampling frequency, and statistical characteristics of the effluent data.

a) Effluent Screening:
Effluent data obtained from the permit application and the Discharge Monitoring Reports (DMRs) has been reviewed and determined to be suitable for evaluation. Effluent data from the monthly Discharge Monitoring Reports from December 2005 through November 2011 was reviewed, and there have been no exceedances of the established limitations.

The following pollutants require a wasteload allocation analysis: Total Residual Chlorine, Zinc, Aluminum, Barium, Iron, Magnesium, Manganese, and Chloroform.

b) Mixing Zones and Wasteload Allocations (WLAs):

Wasteload allocations (WLAs) are calculated for those parameters in the effluent with the reasonable potential to cause an exceedance of water quality criteria.

As discussed in Fact Sheet Section 15.e, a dilution factor of 12 was established in 2002. The dilution factor was based on a study performed by Olver Laboratories (David Griffith, PhD.) on April 16, 2002. This study is still valid and the dilution factor will again be used to establish the WLAs.

Antidegradation Wasteload Allocations (AWLAs).

Since the receiving stream has been determined to be a Tier II water, staff must also determine antidegradation wasteload allocations (AWLAs).

Attachment 7 also details the water quality criteria, public water supply (PWS) and the associated antidegradation wasteload allocations for Outfall 001. To calculate the water quality based antidegradation values, the calculated acute water quality criteria is multiplied by 0.25 and the background concentration in the receiving water is then subtracted to determine the baseline value. This baseline value is then multiplied by the factor of 12 to determine the antidegradation wasteload allocation.

c) Effluent Limitations Toxic Pollutants, Outfall 001 –

9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Those parameters with WLAs and AWLAs that are near effluent concentrations are evaluated for limits.

The VPDES Permit Regulation at 9VAC25-31-230.D requires that monthly and weekly average limitations be imposed for continuous discharges from POTWs and monthly average and daily maximum limitations be imposed for all other continuous non-POTW discharges.

1) Ammonia as N:

There is one data from the application of <0.10 mg/L. It is staff's best professional judgment that there is no reasonable potential to exceed the established WLAs and AWLAs, so no monitoring or effluent limitations are necessary.

2) Total Residual Chlorine:

Chlorine is used for disinfection and is potentially in the discharge. Staff calculated WLAs for TRC using the dilution factor from the 2002 study. In accordance with current DEQ guidance, staff used a default data point of 0.2 mg/L and the calculated WLAs to derive limits. During the last reissuance, a monthly average of 0.024 mg/L and a daily maximum limit of 0.048 mg/L were established for this discharge (Attachment 9). There have been no changes; therefore, staff proposes to carry forward the established limits.

3) Metals:

The current permit included annual monitoring for Dissolved Zinc. In August 2011 the concentration in the effluent was 7 ug/L. The concentration was not quantifiable in August 2010, August 2009, August 2008, and May 2007. Since the discharge is intermittent, only the Acute WLA needs to be considered. The most limiting Acute WLA for Zinc is 110 ug/L. Staff determined that no limit is necessary (Attachment 9) and proposes to remove the monitoring for Dissolved Zinc with this reissuance.

The application indicated that there were detectable levels of Aluminum (515 ug/L) and Magnesium (2,970 ug/L). There are no established WQS for either of these parameters. It is staff's best professional judgment that there is no need for further monitoring for these parameters.

The application indicated that there were detectable concentrations of Barium (18 ug/L) and Iron (106 ug/L). Both of these metals have Human Health criteria established of 2400 ug/L and 360 ug/L respectively. It is staff's best professional judgment that there is no reasonable potential for the effluent concentration to exceed the established Human Health criterion for these two parameters; therefore, no monitoring or effluent limitations are necessary.

The application indicated that there was a detectable concentration for Manganese (52 ug/L). Since the discharge is to a Public Water Supply, a Human Health criterion of 60 ug/L was established. Ambient monitoring in the reservoir in 2008 and 2009 included metals monitoring. The Dissolved Manganese concentrations in the Motts Run Reservoir was determined to be 44.62 ug/L, 1.15 ug/L, 2.62 ug/L, 2.0 ug/L, and 3.35 ug/L. Since these values are also below the established Human Health criterion and there is no water quality impairment, staff does not believe a limit for the effluent is necessary at this time. Staff proposes to include annual Dissolved Manganese monitoring for the next permit cycle. If the monitoring indicates any values above the Human Health criterion of 60 ug/L, then limitations will be considered during the next permit.

4) Chloroform:

The application indicated that there was a detectable concentration of 7 ug/L in the effluent. Since the discharge is to a Public Water Supply, the Human Health criterion of 410 ug/L is applicable. It is staff's best professional judgment that there is no reasonable potential for the effluent concentration to exceed the established Human Health criterion; therefore, no monitoring or effluent limitations are necessary.

d) Effluent Limitations and Monitoring, Outfall 001 – Conventional and Non-Conventional Pollutants

No changes to the total suspended solids (TSS) and pH limitations are proposed.

pH limitations are set at the water quality criteria.

The limit for Total Suspended Solids is based on Best Professional Judgment.

e) Effluent Limitations and Monitoring Summary.

The effluent limitations are presented in the following table. Limits were established for Flow, Total Suspended Solids, pH, and Total Residual Chlorine. Monitoring for Dissolved Manganese is also included.

Sample Type and Frequency are in accordance with the recommendations in the VPDES Permit Manual.

18. Antibacksliding:

All limits in this permit are at least as stringent as those previously established. Backsliding does not apply to this reissuance.

19. Effluent Limitations/Monitoring Requirements:

Maximum Flow of this Industrial Facility is 0.69 MGD.
Effective Dates: During the period beginning with the permit's effective date and lasting until the expiration date.

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Average	Daily Maximum	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL	NA	NA	NL	1/M	Measured
pH (S.U.)	3	NA	NA	6.0 S.U.	9.0 S.U.	1/M	Grab
Total Suspended Solids (mg/L)	2	30 mg/L	NA	NA	60 mg/L	1/M	5G/8HC
Total Residual Chlorine (mg/L)	3	0.024 mg/L	NA	NA	0.048 mg/L	1/D	Grab
Dissolved Manganese (ug/L)	3	NL	NA	NA	NL	1/YR	Grab

The basis for the limitations codes are:
1. Federal Effluent Requirements
2. Best Professional Judgement
3. Water Quality Standards

MGD = Million gallons per day.
NA = Not applicable.
NL = No limit; monitor and report.
S.U. = Standard units.

1/D = Once every day.
1/M = Once every month.
1/YR = Once every year.

5G/8H = 5 Grab/Eight Hour Composite - Consisting of five (5) grab samples collected at hourly intervals until the discharge ceases or five (5) grab samples taken at equal time intervals for the duration of the discharge if the discharge is less than 8 hours in length.

Grab = An individual sample collected over a period of time not to exceed 15-minutes.

20. Other Permit Requirements:

a) Part I.B. of the permit contains quantification levels and compliance reporting instructions. 9VAC25-31-190.L.4.c. requires an arithmetic mean for measurement averaging and 9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Specific analytical methodologies for toxics are listed in this permit section as well as quantification levels (QLs) necessary to demonstrate compliance with applicable permit limitations or for use in future evaluations to determine if the pollutant has reasonable potential to cause or contribute to a violation. Required averaging methodologies are also specified.

b) Whole Effluent Toxicity Program.
The VPDES Permit Regulation at 9VAC25-31-210 requires monitoring and 9VAC25-31-220.I, requires limitations in the permit to provide for and assure compliance with all applicable requirements of the State Water Control Law and the Clean Water Act. A WET Program is imposed for municipal facilities with a design rate >1.0 MGD, with an approved pretreatment program or required to develop a pretreatment program, or those determined by the Board based on effluent variability, compliance history, IWC, and receiving stream characteristics. Attachment 10 contains a summary of the results from the current permit. Since operations have not changed and the facility has passed all toxicity testing since 2002, staff proposes to remove the annual acute testing with the reissued permit.

21. Other Special Conditions:

a) O&M Manual Requirement. Required by Code of Virginia §62.1-44.19; Sewage Collection and Treatment Regulations, 9VAC25-790; VPDES Permit Regulation, 9VAC25-31-190.E. Within 90 days of the effective date of this permit, the permittee shall submit for approval an Operations and Maintenance (O&M) Manual or a statement confirming the accuracy and completeness of the current O&M Manual to the Department of Environmental Quality, Northern Regional Office (DEQ-NRO). Future changes to the facility must be addressed by the submittal of a revised O&M Manual within 90 days of the changes. Non-compliance with the O&M Manual shall be deemed a violation of the permit.

b) Water Quality Criteria Reopener. The VPDES Permit Regulation at 9VAC25-31-220 D. requires establishment of effluent limitations to ensure attainment/maintenance of receiving stream water quality criteria. Should effluent monitoring indicate the need for any water quality-based limitations, this permit may be modified or alternatively revoked and reissued to incorporate appropriate limitations.

c) Materials Handling/Storage. 9VAC25-31-50 A prohibits the discharge of any wastes into State waters unless authorized by permit. Code of Virginia §62.1-44.16 and §62.1-44.17 authorize the Board to regulate the discharge of industrial waste or other waste.

d) Notification Levels The permittee shall notify the Department as soon as they know or have reason to believe:

a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in this permit, if that discharge will exceed the highest of the following notification levels:

(1) One hundred micrograms per liter;

(2) Two hundred micrograms per liter for acrolein and acrylonitrile; five hundred micrograms per liter for 2,4-dinitrophenol and for 2-methyl-4,6-dinitrophenol; and one milligram per liter for antimony;

(3) Five times the maximum concentration value reported for that pollutant in the permit application; or

(4) The level established by the Board.

b. That any activity has occurred or will occur which would result in any discharge, on a nonroutine or infrequent basis, of a toxic pollutant which is not limited in this permit, if that discharge will exceed the highest of the following notification levels:

(1) Five hundred micrograms per liter;

(2) One milligram per liter for antimony;

(3) Ten times the maximum concentration value reported for that pollutant in the permit application; or

(4) The level established by the Board.

Permit Section Part II. Part II of the permit contains standard conditions that appear in all VPDES Permits. In general, these standard conditions address the responsibilities of the permittee, reporting requirements, testing procedures and records retention.

22. Changes to the Permit from the Previously Issued Permit:

a) Special Conditions:
1) The Whole Effluent Toxicity testing was removed with this permit reissuance.

b) Monitoring and Effluent Limitations:
1) The monitoring for Dissolved Zinc was removed with this permit reissuance.
2) Dissolved Manganese monitoring was included with this permit reissuance.

23. Variances/Alternate Limits or Conditions:

None

24. Public Notice Information:

First Public Notice Date: 5/4/12 Second Public Notice Date: 5/11/12

Public Notice Information is required by 9VAC25-31-280 B. All pertinent information is on file and may be inspected, and copied by contacting the: DEQ Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193, Telephone No. (703) 583-3834, Alison.Thompson@deq.virginia.gov. See Attachment 11 for a copy of the public notice document.

Persons may comment in writing or by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address, and telephone number of the writer and of all persons represented by the commenter/requester, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit. Requests for public hearings shall state 1) the reason why a hearing is requested; 2) a brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit; and 3) specific references, where possible, to terms and conditions of the permit with suggested revisions. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given. The public may request an electronic copy of the draft permit and fact sheet or review the draft permit and application at the DEQ Northern Regional Office by appointment.

25. 303(d) Listed Stream Segments and Total Max. Daily Loads (TMDL):

The Motts Run Reservoir is on the 2010 303(d) list for the Fish Consumption Use – Mercury in Fish Tissue. The fish consumption use is categorized as impaired due to a Virginia Department of Health, Division of Health Hazards Control, mercury (Hg) fish consumption advisory. The advisory, dated 8/31/07, limits consumption of largemouth bass to no more than two meals per month. The affected area includes the entirety of Motts Run Reservoir. The TMDL is due in 2020. Ambient data had no detectable mercury concentrations in the five samples collected.

TMDL Reopener: This special condition is to allow the permit to reopened if necessary to bring it in compliance with any applicable TMDL that may be developed and approved for the receiving stream.

26. Additional Comments:

Previous Board Action(s): None.

Staff Comments: None.

Public Comment: Both the Virginia Department of Conservation and Recreation (DCR) and the Virginia Department of Game and Inland Fisheries (DGIF) requested coordination for this permit. DCR responded on February 2, 2012 recommending coordination with DGIF due to the Rappahannock River being designated as a "Threatened and Endangered Species Water" for the Dwarf Wedgemussel. The response also noted that, "The current activity will not affect any documented state-listed plants or insects" and "There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity." DGIF responded on February 28, 2012 and noted that "provided the project adheres to the effluent limitations and monitoring requirements specified in the permit, we do not anticipate the reissuance of this permit to result in adverse impacts to listed species under our review." The DCR and DCR responses have been placed in the reissuance file.

EPA Checklist: The checklist can be found in Attachment 12.

Attachments to the Motts Run WTP (VA0089460) Fact Sheet

Attachment 1	NPDES Industrial Rating Worksheet
Attachment 2	Facility Schematic
Attachment 3	Topographic Map
Attachment 4	Material Storage
Attachment 5	Site Inspection Memorandum
Attachment 6	Planning Statement
Attachment 7	Water Quality Criteria and Wasteload Allocation Calculations
Attachment 8	Mixing Zone Study from April 2002
Attachment 9	Statistical Evaluations for Effluent Limitations
Attachment 10	Whole Effluent Toxicity Summary
Attachment 11	Public Notice
Attachment 12	EPA Checklist

NPDES PERMIT RATING WORK SHEET

[X] Regular Addition
[ ] Discretionary Addition
[ ] Score change, but no status Change
[ ] Deletion

VPDES NO. : VA0089460

Facility Name: Motts Run WTP
City / County: Fredericksburg / Spotsylvania
Receiving Water: Motts Run Reservoir
Reach Number:

Is this facility a steam electric power plant (sic =4911) with one or more of the following characteristics?

1. Power output 500 MW or greater (not using a cooling pond/lake)
2. A nuclear power Plant
3. Cooling water discharge greater than 25% of the receiving stream's 7Q10 flow rater

[ ] Yes; score is 600 (stop here) [X] NO; (continue)

Is this permit for a municipal separate storm sewer serving a population greater than 100,000?

[ ] YES; score is 700 (stop here)
[X] NO; (continue)

FACTOR 1: Toxic Pollutant Potential

PCS SIC Code: _____ Primary Sic Code: 4941 Other Sic Codes: _____ _____ _____

Industrial Subcategory Code: 000 (Code 000 if no subcategory)

Determine the Toxicity potential from Appendix A. Be sure to use the TOTAL toxicity potential column and check one)

Toxicity Group	Code	Points	Toxicity Group	Code	Points	Toxicity Group	Code	Points
[ ] No process waste streams	0	0	[ ] 3.	3	15	[X] 7.	7	35
[ ] 1.	1	5	[ ] 4.	4	20	[ ] 8.	8	40
[ ] 2.	2	10	[ ] 5.	5	25	[ ] 9.	9	45
			[ ] 6.	6	30	[ ] 10.	10	50

Code Number Checked: 7

Total Points Factor 1: 35

FACTOR 2: Flow/Stream Flow Volume (Complete either Section A or Section B; check only one)

Section A – Wastewater Flow Only considered

Wastewater Type (see Instructions)			Code	Points
Type I:	Flow < 5 MGD	[ ]	11	0
	Flow 5 to 10 MGD	[ ]	12	10
	Flow > 10 to 50 MGD	[ ]	13	20
	Flow > 50 MGD	[ ]	14	30
Type II:	Flow < 1 MGD	[X]	21	10
	Flow 1 to 5 MGD	[ ]	22	20
	Flow > 5 to 10 MGD	[ ]	23	30
	Flow > 10 MGD	[ ]	24	50
Type III:	Flow < 1 MGD	[ ]	31	0
	Flow 1 to 5 MGD	[ ]	32	10
	Flow > 5 to 10 MGD	[ ]	33	20
	Flow > 10 MGD	[ ]	34	30

Section B – Wastewater and Stream Flow Considered

Wastewater Type (see Instructions)	Percent of Instream Wastewater Concentration at Receiving Stream Low Flow		Code	Points
Type I/III:	< 10 %	[ ]	41	0
	10 % to < 50 %	[ ]	42	10
	> 50%	[ ]	43	20
Type II:	< 10 %	[ ]	51	0
	10 % to < 50 %	[ ]	52	20
	> 50 %	[ ]	53	30

Code Checked from Section A or B: 21

Total Points Factor 2: 10

NPDES PERMIT RATING WORK SHEET

FACTOR 3: Conventional Pollutants

(only when limited by the permit)

A. Oxygen Demanding Pollutants: (check one) ☐ BOD ☐ COD ☐ Other: _____

Permit Limits: (check one)

		Code	Points
☐	< 100 lbs/day	1	0
☐	100 to 1000 lbs/day	2	5
☐	> 1000 to 3000 lbs/day	3	15
☐	> 3000 lbs/day	4	20

Code Number Checked: NA

Points Scored: 0

B. Total Suspended Solids (TSS)

Permit Limits: (check one)

		Code	Points
☐	< 100 lbs/day	1	0
X	100 to 1000 lbs/day	2	5
☐	> 1000 to 5000 lbs/day	3	15
☐	> 5000 lbs/day	4	20

Code Number Checked: 2

Points Scored: 5

C. Nitrogen Pollutants: (check one) ☐ Ammonia ☐ Other: _____

Permit Limits: (check one)

	Nitrogen Equivalent	Code	Points
☐	< 300 lbs/day	1	0
☐	300 to 1000 lbs/day	2	5
☐	> 1000 to 3000 lbs/day	3	15
☐	> 3000 lbs/day	4	20

Code Number Checked: NA

Points Scored: 0

Total Points Factor 3: 5

FACTOR 4: Public Health Impact

Is there a public drinking water supply located within 50 miles downstream of the effluent discharge (this include any body of water to which the receiving water is a tributary)? A public drinking water supply may include infiltration galleries, or other methods of conveyance that ultimately get water from the above reference supply.

☒ YES; (If yes, check toxicity potential number below)

☐ NO; (If no, go to Factor 5)

Determine the *Human Health* potential from Appendix A. Use the same SIC doe and subcategory reference as in Factor 1. (Be sure to use the *Human Health* toxicity group column – check one below)

Toxicity Group	Code	Points	Toxicity Group	Code	Points	Toxicity Group	Code	Points
☐ No process waste streams	0	0	☐ 3.	3	0	☒ 7.	7	15
☐ 1.	1	0	☐ 4.	4	0	☐ 8.	8	20
☐ 2.	2	0	☐ 5.	5	5	☐ 9.	9	25
			☐ 6.	6	10	☐ 10.	10	30

Code Number Checked: 7

Total Points Factor 4: 15

NPDES PERMIT RATING WORK SHEET

FACTOR 5: Water Quality Factors

A. *Is (or will) one or more of the effluent discharge limits based on water quality factors of the receiving stream (rather than technology-base federal effluent guidelines, or technology-base state effluent guidelines), or has a wasteload allocation been to the discharge*

		Code	Points
[X]	YES	1	10
[ ]	NO	2	0

B. *Is the receiving water in compliance with applicable water quality standards for pollutants that are water quality limited in the permit?*

		Code	Points
[X]	YES	1	0
[ ]	NO	2	5

C. *Does the effluent discharged from this facility exhibit the reasonable potential to violate water quality standards due to whole effluent toxicity?*

		Code	Points
[ ]	YES	1	10
[X]	NO	2	0

Code Number Checked: A 1 B 1 C 2

Points Factor 5: A 10 + B 0 + C 0 = **10**

FACTOR 6: Proximity to Near Coastal Waters

A. Base Score: Enter flow code here (from factor 2) _____

Check appropriate facility HPRI code (from PCS):

	HPRI#	Code	HPRI Score
[ ]	1	1	20
[ ]	2	2	0
[ ]	3	3	30
[X]	4	4	0
[ ]	5	5	20

Enter the multiplication factor that corresponds to the flow code: _____

Flow Code	Multiplication Factor
11, 31, or 41	0.00
12, 32, or 42	0.05
13, 33, or 43	0.10
14 or 34	0.15
21 or 51	0.10
22 or 52	0.30
23 or 53	0.60
24	1.00

HPRI code checked : 4

Base Score (HPRI Score): 0 X (Multiplication Factor) 0.10 = 0

B. Additional Points – NEP Program

For a facility that has an HPRI code of 3, does the facility discharge to one of the estuaries enrolled in the National Estuary Protection (NEP) program (see instructions) or the Chesapeake Bay?

	Code	Points
[ ]	1	10
[X]	2	0

C. Additional Points – Great Lakes Area of Concern

For a facility that has an HPRI code of 5, does the facility discharge any of the pollutants of concern into one of the Great Lakes' 31 area's of concern (see instructions)?

	Code	Points
[ ]	1	10
[X]	2	0

Code Number Checked: A 4 B 2 C 2

Points Factor 6: A 0 + B 0 + C 0 = **0**

NPDES PERMIT RATING WORK SHEET

SCORE SUMMARY

Factor	Description	Total Points
1	Toxic Pollutant Potential	35
2	Flows / Streamflow Volume	10
3	Conventional Pollutants	5
4	Public Health Impacts	15
5	Water Quality Factors	10
6	Proximity to Near Coastal Waters	0
	TOTAL (Factors 1 through 6)	**75**

S1. Is the total score equal to or grater than 80 ☐ YES; (Facility is a Major) ☒ NO

S2. If the answer to the above questions is no, would you like this facility to be discretionary major?

☒ NO

☐ YES; (Add 500 points to the above score and provide reason below:

Reason: _____

NEW SCORE : 75

OLD SCORE : 75

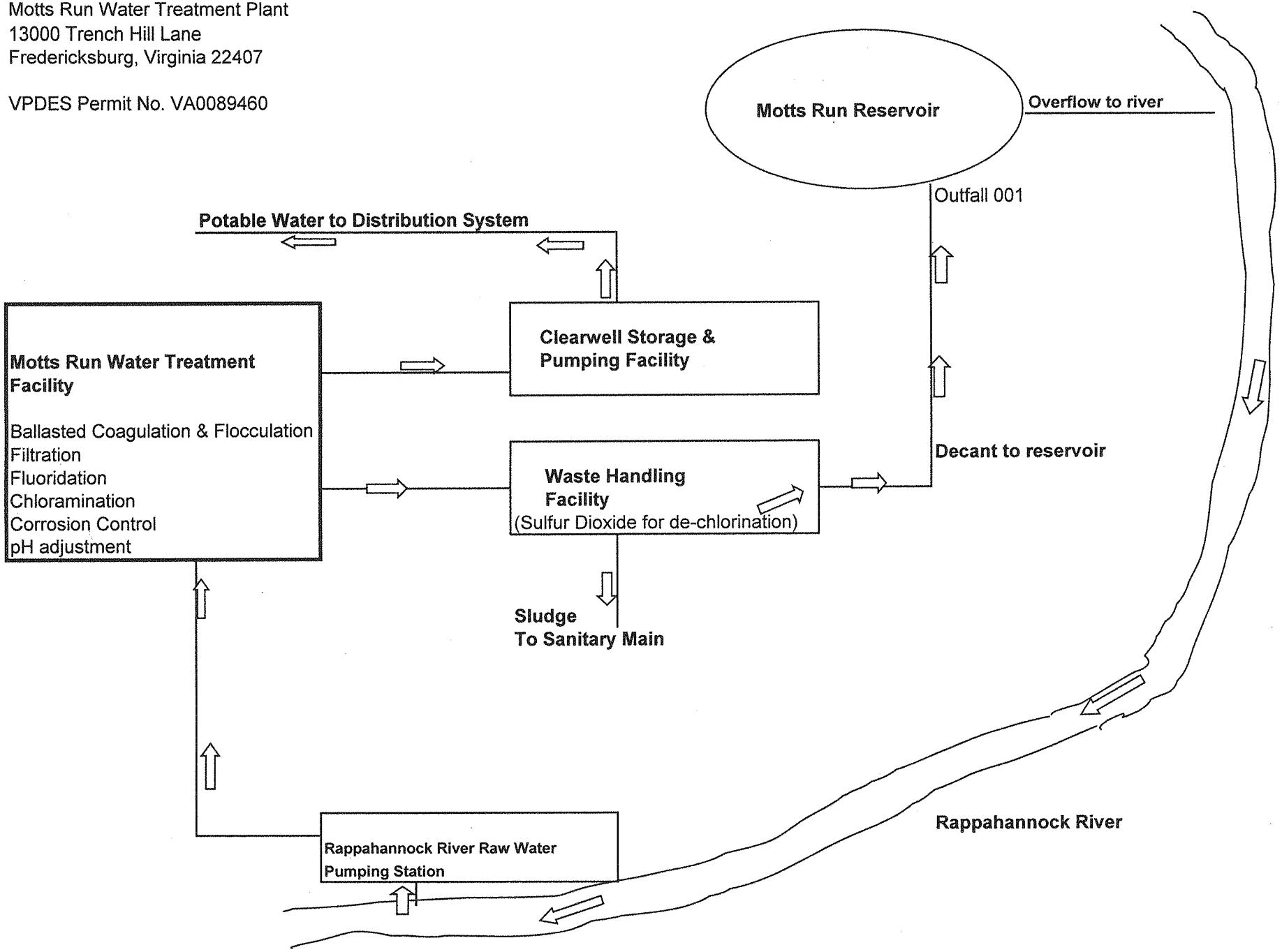
Permit Reviewer's Name : Alison Thompson

Phone Number: (703) 583-3834

Date: January 31, 2012

Motts Run Water Treatment Plant
13000 Trench Hill Lane
Fredericksburg, Virginia 22407

VPDES Permit No. VA0089460



Attachment 2

Attachment 3

SPOTSYLVANIA COUNTY
Department of Utilities

Mott's Run Water Treatment Plant
13000 Trench Hill Lane
Fredericksburg, Virginia 22407
Phone: (540) 507-7344
Fax: (540) 785-0791

Chemicals stored at the Motts Run WTP Facility

CHEMICAL	AMOUNT STORED 30 DAYS	AREA STORED
Liquid Alum	9,000 gallons	Administration Building
Lime	11,000 pounds	Administration Building
Polymer: CIBA Magna-Floc E30	275 gallons	Administration Building
Polymer: CIBA Magna-Floc (Filter Aid)	275 gallons	Administration Building
Chlorine Gas (Disinfectant)	18,000 pounds	Administration Building
Hydrofluosilicic Acid (Fluoridation)	5,000 gallons	Administration Building
Sulfur Dioxide	900 pounds	Wastewater Basin Building
Caustic Soda	5,000 gallons	Administration Building
Calci-Quest (Corrosion Inhibitor)	900 gallons	Administration Building
Potassium Permanganate	1,265 pounds	Administration Building
Carbon	2,560 pounds	Administration Building
Anhydrous Ammonia	3,500 pounds	Outside, Rear of Building

February 23, 2012

MEMORANDUM

TO: Motts Run Water Treatment Plant Permit File (VA0089460)

FROM: Alison Thompson

SUBJECT: Permit Reissuance Site Inspection

The purpose of this memo is to document the conditions at the Motts Run Water Treatment Plant (WTP) and receiving stream (Motts Run Reservoir) observed during the site inspection conducted on February 22, 2012. Christopher Edwards, Rick Hall, and Kelvin Jenkins of Spotsylvania County Utilities were present at the inspection.

The WTP is rated at 12 million gallons per day MGD) on the water production side with a conditional permit to produce 15 MGD. The average production is currently 8 MGD. Raw water is either pumped from the Rappahannock River or from the Motts Run Reservoir. The facility consists of chemical coagulation in two contact basins, two rapid mixers, four inline slow mixing chambers, four clarifiers, five multimedia filters and a clear well prior to final distribution.

Contributions to the effluent include filter backwash, pipe gallery and pump station floor drains, and instrumentation flow. The five filters are backwashed manually every 40-60 hours with 60 hours as the maximum allowed time before a filter is backwashed. The backwash water flows into one of two sedimentation basins and time is allowed for the solids to settle. The solids are scraped to one end of the basin and pumped to one of the two sludge basins where they are combined with the sludge from the slow mix chambers and then discharged to the sanitary sewer. A Wallace & Tiernan inline chlorine analyzer is used to monitor the sulfur dioxide addition; monitoring for the VPDES permit is done by the operators. Discharge volume is determined using a flow meter. The flow meter is also used to determine the amount of sulfur dioxide to inject for dechlorination. The flow meter is calibrated annually with the last calibration done on December 21, 2011. While the backwash of the filters is controlled by the operators, the discharge is accomplished automatically with the SCADA system.

The dechlorinated decant water is discharged via Outfall 001 to the Motts Run Reservoir. It is an intermittent discharge.

The outfall from the facility, located on Motts Run Reservoir, approximately 200 yards from the reservoir spill way was also inspected. The discharge travels roughly 500 yards underground from the wastewater sedimentation basins. It then travels into a rip rap lined ditch approximately 100 yards until it enters the reservoir. There were no solids noted around this shore-based outfall.

To: Alison Thompson
From: Jennifer Carlson

Date: January 18, 2012
Subject: Planning Statement for Motts Run WTP
Permit No: VA0089460

Discharge Type: Industrial
Discharge Flow: 0.27 mgd

Receiving Stream: Motts Run Reservoir
Latitude / Longitude: 38 18 37.06 77 32 33.25
Streamcode: 3-MOT
Waterbody: VAN-E19L
Rivermile: 0.26
Water Quality Stds: Class III, Section 4c, sp. stds. PWS

1. Is there monitoring data for the receiving stream?

   Yes, there is monitoring data for Motts Run Reservoir

   - If yes, please attach latest summary.

   The following is the summary for the lower segment of Motts Run Reservoir, as taken from the 2010 Integrated Report:

   Class III, Section 4c, special stds. PWS.

   DEQ lake monitoring stations 3-MOT000.39, Motts Run Reservoir, one hundred feet from the dam, and 3-MOT001.19.

   Note: The pH impairment will be delisted in the 2010 cycle.

   The fish consumption use is categorized as impaired due to a Virginia Department of Health, Division of Health Hazards Control, mercury fish consumption advisory. According to the advisory, Largemouth Bass consumption should be limited to no more than 2 meals per month. Additionally, excursions above the risk-based tissue value (TV) of 300 parts per billion (ppb) for mercury (Hg) in fish tissue were recorded in tissue from one specie (largemouth bass) of fish sampled (6 total excursions) in 2006 at monitoring station 3-MOT000.39.

Nutrient data collected during the 2003 and 2008 lake monitoring seasons shows that the aquatic life use, as evaluated by nutrients, is fully supporting. DO and pH data also show that the aquatic life use is fully supporting.

The public water supply, recreation, and wildlife uses are considered fully supporting.

- If no, where is the nearest downstream monitoring station.

2. Is the receiving stream on the current 303(d) list?

Yes, Motts Run Reservoir is on the 2010 303(d) list.

- If yes, what is the impairment?

Fish Consumption Use – Mercury in Fish Tissue:

The fish consumption use is categorized as impaired due to a Virginia Department of Health, Division of Health Hazards Control, mercury (Hg) fish consumption advisory. The advisory, dated 8/31/07, limits consumption of largemouth bass to no more than two meals per month. The affected area includes the entirety of Motts Run Reservoir.

- Has the TMDL been prepared?

No, a TMDL has not yet been prepared.

- If yes, what is the WLA for the discharge? N/A

- If no, what is the schedule for the TMDL?

The fish consumption TMDL for mercury is scheduled by completion by 2020.

3. If the answer to (2) above is no, is there a downstream 303(d) listed impairment? N/A

- If yes, what is the impairment? N/A

- Has a TMDL been prepared? N/A

- Will the TMDL include the receiving stream? N/A

- Is there a WLA for the discharge? N/A

- What is the schedule for the TMDL? N/A

4. Is there monitoring or other conditions that Planning/Assessment needs in the permit?

   There is a completed downstream TMDL for the aquatic life use impairment for the Chesapeake Bay. However, the Bay TMDL and the WLAs contained within the TMDL are not addressed in this planning statement.

5. Fact Sheet Requirements – Please provide information on other VPDES permits or VADEQ monitoring stations located within a 2 mile radius of the facility. In addition, please provide information on any drinking water intakes located within a 5 mile radius of the facility.

   The two public water supply intakes for Motts Run WTP are located within a 5 mile radius of this facility. One is located downstream of Motts Run on the Rappahannock River, and the other is located in Motts Run Reservoir.

   Within a 2 mile radius of the facility, there are 3 DEQ monitoring stations:

   1. 3-MOT001.19 – ambient monitoring (lake), upper Motts Run Reservoir
   2. 3-MOT000.39 – ambient monitoring (lake), Motts Run Reservoir – 100 ft from dam
   3. 3-RPP113.37 – ambient/trend monitoring, Rappahannock River at USGS cableway

   There are no VPDES facilities within a 2 mile radius of this facility.

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Motts Run WTP Permit No.: VA0089460

Receiving Stream: Motts Run Reservoir Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information			Stream Flows			Mixing Information			Effluent Information		
Mean Hardness (as CaCO3) =	16.4	mg/L	1Q10 (Annual) =	11	MGD	Annual - 1Q10 Mix =	100	%	Mean Hardness (as CaCO3) =	31	mg/L
90% Temperature (Annual) =	29.34	deg C	7Q10 (Annual) =	11	MGD	- 7Q10 Mix =	100	%	90% Temp (Annual) =	33	deg C
90% Temperature (Wet season) =	10	deg C	30Q10 (Annual) =	11	MGD	- 30Q10 Mix =	100	%	90% Temp (Wet season) =	1	deg C
90% Maximum pH =	8.9	SU	1Q10 (Wet season) =	11	MGD	Wet Season - 1Q10 Mix =	100	%	90% Maximum pH =	6.8	SU
10% Maximum pH =		SU	30Q10 (Wet season)	11	MGD	- 30Q10 Mix =	100	%	10% Maximum pH =		SU
Tier Designation (1 or 2) =	2		30Q5 =	11	MGD				Discharge Flow =	1	MGD
Public Water Supply (PWS) Y/N? =	y		Harmonic Mean =	11	MGD						
Trout Present Y/N? =	n										
Early Life Stages Present Y/N? =	y										

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Acenapthene	0	--	--	6.7E+02	9.9E+02	--	--	8.0E+03	1.2E+04	--	--	6.7E+01	9.9E+01	--	--	8.0E+02	1.2E+03	--	--	**8.0E+02**	**1.2E+03**
Acrolein	0	--	--	6.1E+00	9.3E+00	--	--	7.3E+01	1.1E+02	--	--	6.1E-01	9.3E-01	--	--	7.3E+00	1.1E+01	--	--	**7.3E+00**	**1.1E+01**
Acrylonitrile [C]	0	--	--	5.1E-01	2.5E+00	--	--	6.1E+00	3.0E+01	--	--	5.1E-02	2.5E-01	--	--	6.1E-01	3.0E+00	--	--	**6.1E-01**	**3.0E+00**
Aldrin [C]	0	3.0E+00	--	4.9E-04	5.0E-04	3.6E+01	--	5.9E-03	6.0E-03	7.5E-01	--	4.9E-05	5.0E-05	9.0E+00	--	5.9E-04	6.0E-04	**9.0E+00**	--	**5.9E-04**	**6.0E-04**
Ammonia-N (mg/l) (Yearly)	0	1.12E+01	1.14E+00	--	--	1.35E+02	1.36E+01	--	--	2.81E+00	2.84E-01	--	--	3.37E+01	3.41E+00	--	--	**3.37E+01**	**3.41E+00**	--	--
Ammonia-N (mg/l) (High Flow)	0	1.12E+01	3.02E+00	--	--	1.35E+02	3.62E+01	--	--	2.81E+00	7.54E-01	--	--	3.37E+01	9.05E+00	--	--	**3.37E+01**	**9.05E+00**	--	--
Anthracene	0	--	--	8.3E+03	4.0E+04	--	--	1.0E+05	4.8E+05	--	--	8.3E+02	4.0E+03	--	--	1.0E+04	4.8E+04	--	--	**1.0E+04**	**4.8E+04**
Antimony	0	--	--	5.6E+00	6.4E+02	--	--	6.7E+01	7.7E+03	--	--	5.6E-01	6.4E+01	--	--	6.7E+00	7.7E+02	--	--	**6.7E+00**	**7.7E+02**
Arsenic	0	3.4E+02	1.5E+02	1.0E+01	--	4.1E+03	1.8E+03	1.2E+02	--	8.5E+01	3.8E+01	1.0E+00	--	1.0E+03	4.5E+02	1.2E+01	--	**1.0E+03**	**4.5E+02**	**1.2E+01**	--
Barium	0	--	--	2.0E+03	--	--	--	2.4E+04	--	--	--	2.0E+02	--	--	--	2.4E+03	--	--	--	**2.4E+03**	--
Benzene [C]	0	--	--	2.2E+01	5.1E+02	--	--	2.6E+02	6.1E+03	--	--	2.2E+00	5.1E+01	--	--	2.6E+01	6.1E+02	--	--	**2.6E+01**	**6.1E+02**
Benzidine [C]	0	--	--	8.6E-04	2.0E-03	--	--	1.0E-02	2.4E-02	--	--	8.6E-05	2.0E-04	--	--	1.0E-03	2.4E-03	--	--	**1.0E-03**	**2.4E-03**
Benzo (a) anthracene [C]	0	--	--	3.8E-02	1.8E-01	--	--	4.6E-01	2.2E+00	--	--	3.8E-03	1.8E-02	--	--	4.6E-02	2.2E-01	--	--	**4.6E-02**	**2.2E-01**
Benzo (b) fluoranthene [C]	0	--	--	3.8E-02	1.8E-01	--	--	4.6E-01	2.2E+00	--	--	3.8E-03	1.8E-02	--	--	4.6E-02	2.2E-01	--	--	**4.6E-02**	**2.2E-01**
Benzo (k) fluoranthene [C]	0	--	--	3.8E-02	1.8E-01	--	--	4.6E-01	2.2E+00	--	--	3.8E-03	1.8E-02	--	--	4.6E-02	2.2E-01	--	--	**4.6E-02**	**2.2E-01**
Benzo (a) pyrene [C]	0	--	--	3.8E-02	1.8E-01	--	--	4.6E-01	2.2E+00	--	--	3.8E-03	1.8E-02	--	--	4.6E-02	2.2E-01	--	--	**4.6E-02**	**2.2E-01**
Bis2-Chloroethyl Ether [C]	0	--	--	3.0E-01	5.3E+00	--	--	3.6E+00	6.4E+01	--	--	3.0E-02	5.3E-01	--	--	3.6E-01	6.4E+00	--	--	**3.6E-01**	**6.4E+00**
Bis2-Chloroisopropyl Ether	0	--	--	1.4E+03	6.5E+04	--	--	1.7E+04	7.8E+05	--	--	1.4E+02	6.5E+03	--	--	1.7E+03	7.8E+04	--	--	**1.7E+03**	**7.8E+04**
Bis 2-Ethylhexyl Phthalate [C]	0	--	--	1.2E+01	2.2E+01	--	--	1.4E+02	2.6E+02	--	--	1.2E+00	2.2E+00	--	--	1.4E+01	2.6E+01	--	--	**1.4E+01**	**2.6E+01**
Bromoform [C]	0	--	--	4.3E+01	1.4E+03	--	--	5.2E+02	1.7E+04	--	--	4.3E+00	1.4E+02	--	--	5.2E+01	1.7E+03	--	--	**5.2E+01**	**1.7E+03**
Butylbenzylphthalate	0	--	--	1.5E+03	1.9E+03	--	--	1.8E+04	2.3E+04	--	--	1.5E+02	1.9E+02	--	--	1.8E+03	2.3E+03	--	--	**1.8E+03**	**2.3E+03**
Cadmium	0	8.2E-01	3.8E-01	5.0E+00	--	9.9E+00	4.6E+00	6.0E+01	--	2.1E-01	9.5E-02	5.0E-01	--	2.5E+00	1.1E+00	6.0E+00	--	**2.5E+00**	**1.1E+00**	**6.0E+00**	--
Carbon Tetrachloride [C]	0	--	--	2.3E+00	1.6E+01	--	--	2.8E+01	1.9E+02	--	--	2.3E-01	1.6E+00	--	--	2.8E+00	1.9E+01	--	--	**2.8E+00**	**1.9E+01**
Chlordane [C]	0	2.4E+00	4.3E-03	8.0E-03	8.1E-03	2.9E+01	5.2E-02	9.6E-02	9.7E-02	6.0E-01	1.1E-03	8.0E-04	8.1E-04	7.2E+00	1.3E-02	9.6E-03	9.7E-03	**7.2E+00**	**1.3E-02**	**9.6E-03**	**9.7E-03**
Chloride	0	8.6E+05	2.3E+05	2.5E+05	--	1.0E+07	2.8E+06	3.0E+06	--	2.2E+05	5.8E+04	2.5E+04	--	2.6E+06	6.9E+05	3.0E+05	--	**2.6E+06**	**6.9E+05**	**3.0E+05**	--
TRC	0	1.9E+01	1.1E+01	--	--	2.3E+02	1.3E+02	--	--	4.8E+00	2.8E+00	--	--	5.7E+01	3.3E+01	--	--	**5.7E+01**	**3.3E+01**	--	--
Chlorobenzene	0	--	--	1.3E+02	1.6E+03	--	--	1.6E+03	1.9E+04	--	--	1.3E+01	1.6E+02	--	--	1.6E+02	1.9E+03	--	--	**1.6E+02**	**1.9E+03**

Attachment 7

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorodibromomethane[C]	0	--	--	4.0E+00	1.3E+02	--	--	4.8E+01	1.6E+03	--	--	4.0E-01	1.3E+01	--	--	4.8E+00	1.6E+02	--	--	**4.8E+00**	**1.6E+02**
Chloroform	0	--	--	3.4E+02	1.1E+04	--	--	4.1E+03	1.3E+05	--	--	3.4E+01	1.1E+03	--	--	4.1E+02	1.3E+04	--	--	**4.1E+02**	**1.3E+04**
2-Chloronaphthalene	0	--	--	1.0E+03	1.6E+03	--	--	1.2E+04	1.9E+04	--	--	1.0E+02	1.6E+02	--	--	1.2E+03	1.9E+03	--	--	**1.2E+03**	**1.9E+03**
2-Chlorophenol	0	--	--	8.1E+01	1.5E+02	--	--	9.7E+02	1.8E+03	--	--	8.1E+00	1.5E+01	--	--	9.7E+01	1.8E+02	--	--	**9.7E+01**	**1.8E+02**
Chlorpyrifos	0	8.3E-02	4.1E-02	--	--	1.0E+00	4.9E-01	--	--	2.1E-02	1.0E-02	--	--	2.5E-01	1.2E-01	--	--	**2.5E-01**	**1.2E-01**	--	--
Chromium III	0	1.8E+02	2.4E+01	--	--	2.2E+03	2.9E+02	--	--	4.6E+01	6.0E+00	--	--	5.5E+02	7.1E+01	--	--	**5.5E+02**	**7.1E+01**	--	--
Chromium VI	0	1.6E+01	1.1E+01	--	--	1.9E+02	1.3E+02	--	--	4.0E+00	2.8E+00	--	--	4.8E+01	3.3E+01	--	--	**4.8E+01**	**3.3E+01**	--	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	1.2E+03	--	--	--	1.0E+01	--	--	--	1.2E+02	--	--	--	**1.2E+02**	--
Chrysene [C]	0	--	--	3.8E-03	1.8E-02	--	--	4.6E-02	2.2E-01	--	--	3.8E-04	1.8E-03	--	--	4.6E-03	2.2E-02	--	--	**4.6E-03**	**2.2E-02**
Copper	0	3.6E+00	2.7E+00	1.3E+03	--	4.4E+01	3.3E+01	1.6E+04	--	9.1E-01	6.8E-01	1.3E+02	--	1.1E+01	8.2E+00	1.6E+03	--	**1.1E+01**	**8.2E+00**	**1.6E+03**	--
Cyanide, Free	0	2.2E+01	5.2E+00	1.4E+02	1.6E+04	2.6E+02	6.2E+01	1.7E+03	1.9E+05	5.5E+00	1.3E+00	1.4E+01	1.6E+03	6.6E+01	1.6E+01	1.7E+02	1.9E+04	**6.6E+01**	**1.6E+01**	**1.7E+02**	**1.9E+04**
DDD [C]	0	--	--	3.1E-03	3.1E-03	--	--	3.7E-02	3.7E-02	--	--	3.1E-04	3.1E-04	--	--	3.7E-03	3.7E-03	--	--	**3.7E-03**	**3.7E-03**
DDE [C]	0	--	--	2.2E-03	2.2E-03	--	--	2.6E-02	2.6E-02	--	--	2.2E-04	2.2E-04	--	--	2.6E-03	2.6E-03	--	--	**2.6E-03**	**2.6E-03**
DDT [C]	0	1.1E+00	1.0E-03	2.2E-03	2.2E-03	1.3E+01	1.2E-02	2.6E-02	2.6E-02	2.8E-01	2.5E-04	2.2E-04	2.2E-04	3.3E+00	3.0E-03	2.6E-03	2.6E-03	**3.3E+00**	**3.0E-03**	**2.6E-03**	**2.6E-03**
Demeton	0	--	1.0E-01	--	--	--	1.2E+00	--	--	--	2.5E-02	--	--	--	3.0E-01	--	--	--	**3.0E-01**	--	--
Diazinon	0	1.7E-01	1.7E-01	--	--	2.0E+00	2.0E+00	--	--	4.3E-02	4.3E-02	--	--	5.1E-01	5.1E-01	--	--	**5.1E-01**	**5.1E-01**	--	--
Dibenz(a,h)anthracene [C]	0	--	--	3.8E-02	1.8E-01	--	--	4.6E-01	2.2E+00	--	--	3.8E-03	1.8E-02	--	--	4.6E-02	2.2E-01	--	--	**4.6E-02**	**2.2E-01**
1,2-Dichlorobenzene	0	--	--	4.2E+02	1.3E+03	--	--	5.0E+03	1.6E+04	--	--	4.2E+01	1.3E+02	--	--	5.0E+02	1.6E+03	--	--	**5.0E+02**	**1.6E+03**
1,3-Dichlorobenzene	0	--	--	3.2E+02	9.6E+02	--	--	3.8E+03	1.2E+04	--	--	3.2E+01	9.6E+01	--	--	3.8E+02	1.2E+03	--	--	**3.8E+02**	**1.2E+03**
1,4-Dichlorobenzene	0	--	--	6.3E+01	1.9E+02	--	--	7.6E+02	2.3E+03	--	--	6.3E+00	1.9E+01	--	--	7.6E+01	2.3E+02	--	--	**7.6E+01**	**2.3E+02**
3,3-Dichlorobenzidine[C]	0	--	--	2.1E-01	2.8E-01	--	--	2.5E+00	3.4E+00	--	--	2.1E-02	2.8E-02	--	--	2.5E-01	3.4E-01	--	--	**2.5E-01**	**3.4E-01**
Dichlorobromomethane [C]	0	--	--	5.5E+00	1.7E+02	--	--	6.6E+01	2.0E+03	--	--	5.5E-01	1.7E+01	--	--	6.6E+00	2.0E+02	--	--	**6.6E+00**	**2.0E+02**
1,2-Dichloroethane [C]	0	--	--	3.8E+00	3.7E+02	--	--	4.6E+01	4.4E+03	--	--	3.8E-01	3.7E+01	--	--	4.6E+00	4.4E+02	--	--	**4.6E+00**	**4.4E+02**
1,1-Dichloroethylene	0	--	--	3.3E+02	7.1E+03	--	--	4.0E+03	8.5E+04	--	--	3.3E+01	7.1E+02	--	--	4.0E+02	8.5E+03	--	--	**4.0E+02**	**8.5E+03**
1,2-trans-dichloroethylene	0	--	--	1.4E+02	1.0E+04	--	--	1.7E+03	1.2E+05	--	--	1.4E+01	1.0E+03	--	--	1.7E+02	1.2E+04	--	--	**1.7E+02**	**1.2E+04**
2,4-Dichlorophenol	0	--	--	7.7E+01	2.9E+02	--	--	9.2E+02	3.5E+03	--	--	7.7E+00	2.9E+01	--	--	9.2E+01	3.5E+02	--	--	**9.2E+01**	**3.5E+02**
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	1.0E+02	--	--	--	1.2E+03	--	--	--	1.0E+01	--	--	--	1.2E+02	--	--	--	**1.2E+02**	--
1,2-Dichloropropane[C]	0	--	--	5.0E+00	1.5E+02	--	--	6.0E+01	1.8E+03	--	--	5.0E-01	1.5E+01	--	--	6.0E+00	1.8E+02	--	--	**6.0E+00**	**1.8E+02**
1,3-Dichloropropene [C]	0	--	--	3.4E+00	2.1E+02	--	--	4.1E+01	2.5E+03	--	--	3.4E-01	2.1E+01	--	--	4.1E+00	2.5E+02	--	--	**4.1E+00**	**2.5E+02**
Dieldrin [C]	0	2.4E-01	5.6E-02	5.2E-04	5.4E-04	2.9E+00	6.7E-01	6.2E-03	6.5E-03	6.0E-02	1.4E-02	5.2E-05	5.4E-05	7.2E-01	1.7E-01	6.2E-04	6.5E-04	**7.2E-01**	**1.7E-01**	**6.2E-04**	**6.5E-04**
Diethyl Phthalate	0	--	--	1.7E+04	4.4E+04	--	--	2.0E+05	5.3E+05	--	--	1.7E+03	4.4E+03	--	--	2.0E+04	5.3E+04	--	--	**2.0E+04**	**5.3E+04**
2,4-Dimethylphenol	0	--	--	3.8E+02	8.5E+02	--	--	4.6E+03	1.0E+04	--	--	3.8E+01	8.5E+01	--	--	4.6E+02	1.0E+03	--	--	**4.6E+02**	**1.0E+03**
Dimethyl Phthalate	0	--	--	2.7E+05	1.1E+06	--	--	3.2E+06	1.3E+07	--	--	2.7E+04	1.1E+05	--	--	3.2E+05	1.3E+06	--	--	**3.2E+05**	**1.3E+06**
Di-n-Butyl Phthalate	0	--	--	2.0E+03	4.5E+03	--	--	2.4E+04	5.4E+04	--	--	2.0E+02	4.5E+02	--	--	2.4E+03	5.4E+03	--	--	**2.4E+03**	**5.4E+03**
2,4 Dinitrophenol	0	--	--	6.9E+01	5.3E+03	--	--	8.3E+02	6.4E+04	--	--	6.9E+00	5.3E+02	--	--	8.3E+01	6.4E+03	--	--	**8.3E+01**	**6.4E+03**
2-Methyl-4,6-Dinitrophenol	0	--	--	1.3E+01	2.8E+02	--	--	1.6E+02	3.4E+03	--	--	1.3E+00	2.8E+01	--	--	1.6E+01	3.4E+02	--	--	**1.6E+01**	**3.4E+02**
2,4-Dinitrotoluene [C]	0	--	--	1.1E+00	3.4E+01	--	--	1.3E+01	4.1E+02	--	--	1.1E-01	3.4E+00	--	--	1.3E+00	4.1E+01	--	--	**1.3E+00**	**4.1E+01**
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	5.0E-08	5.1E-08	--	--	6.0E-07	6.1E-07	--	--	5.0E-09	5.1E-09	--	--	6.0E-08	6.1E-08	--	--	**6.0E-08**	**6.1E-08**
1,2-Diphenylhydrazine[C]	0	--	--	3.6E-01	2.0E+00	--	--	4.3E+00	2.4E+01	--	--	3.6E-02	2.0E-01	--	--	4.3E-01	2.4E+00	--	--	**4.3E-01**	**2.4E+00**
Alpha-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	2.6E+00	6.7E-01	7.4E+02	1.1E+03	5.5E-02	1.4E-02	6.2E+00	8.9E+00	6.6E-01	1.7E-01	7.4E+01	1.1E+02	**6.6E-01**	**1.7E-01**	**7.4E+01**	**1.1E+02**
Beta-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	2.6E+00	6.7E-01	7.4E+02	1.1E+03	5.5E-02	1.4E-02	6.2E+00	8.9E+00	6.6E-01	1.7E-01	7.4E+01	1.1E+02	**6.6E-01**	**1.7E-01**	**7.4E+01**	**1.1E+02**
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	2.6E+00	6.7E-01	--	--	5.5E-02	1.4E-02	--	--	6.6E-01	1.7E-01	--	--	**6.6E-01**	**1.7E-01**	--	--
Endosulfan Sulfate	0	--	--	6.2E+01	8.9E+01	--	--	7.4E+02	1.1E+03	--	--	6.2E+00	8.9E+00	--	--	7.4E+01	1.1E+02	--	--	**7.4E+01**	**1.1E+02**
Endrin	0	8.6E-02	3.6E-02	5.9E-02	6.0E-02	1.0E+00	4.3E-01	7.1E-01	7.2E-01	2.2E-02	9.0E-03	5.9E-03	6.0E-03	2.6E-01	1.1E-01	7.1E-02	7.2E-02	**2.6E-01**	**1.1E-01**	**7.1E-02**	**7.2E-02**
Endrin Aldehyde	0	--	--	2.9E-01	3.0E-01	--	--	3.5E+00	3.6E+00	--	--	2.9E-02	3.0E-02	--	--	3.5E-01	3.6E-01	--	--	**3.5E-01**	**3.6E-01**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	--	--	5.3E+02	2.1E+03	--	--	6.4E+03	2.5E+04	--	--	5.3E+01	2.1E+02	--	--	6.4E+02	2.5E+03	--	--	**6.4E+02**	**2.5E+03**
Fluoranthene	0	--	--	1.3E+02	1.4E+02	--	--	1.6E+03	1.7E+03	--	--	1.3E+01	1.4E+01	--	--	1.6E+02	1.7E+02	--	--	**1.6E+02**	**1.7E+02**
Fluorene	0	--	--	1.1E+03	5.3E+03	--	--	1.3E+04	6.4E+04	--	--	1.1E+02	5.3E+02	--	--	1.3E+03	6.4E+03	--	--	**1.3E+03**	**6.4E+03**
Foaming Agents	0	--	--	5.0E+02	--	--	--	6.0E+03	--	--	--	5.0E+01	--	--	--	6.0E+02	--	--	--	**6.0E+02**	--
Guthion	0	--	1.0E-02	--	--	--	1.2E-01	--	--	--	2.5E-03	--	--	--	3.0E-02	--	--	--	**3.0E-02**	--	--
Heptachlor [C]	0	5.2E-01	3.8E-03	7.9E-04	7.9E-04	6.2E+00	4.6E-02	9.5E-03	9.5E-03	1.3E-01	9.5E-04	7.9E-05	7.9E-05	1.6E+00	1.1E-02	9.5E-04	9.5E-04	**1.6E+00**	**1.1E-02**	**9.5E-04**	**9.5E-04**
Heptachlor Epoxide[C]	0	5.2E-01	3.8E-03	3.9E-04	3.9E-04	6.2E+00	4.6E-02	4.7E-03	4.7E-03	1.3E-01	9.5E-04	3.9E-05	3.9E-05	1.6E+00	1.1E-02	4.7E-04	4.7E-04	**1.6E+00**	**1.1E-02**	**4.7E-04**	**4.7E-04**
Hexachlorobenzene[C]	0	--	--	2.8E-03	2.9E-03	--	--	3.4E-02	3.5E-02	--	--	2.8E-04	2.9E-04	--	--	3.4E-03	3.5E-03	--	--	**3.4E-03**	**3.5E-03**
Hexachlorobutadiene[C]	0	--	--	4.4E+00	1.8E+02	--	--	5.3E+01	2.2E+03	--	--	4.4E-01	1.8E+01	--	--	5.3E+00	2.2E+02	--	--	**5.3E+00**	**2.2E+02**
Hexachlorocyclohexane Alpha-BHC[C]	0	--	--	2.6E-02	4.9E-02	--	--	3.1E-01	5.9E-01	--	--	2.6E-03	4.9E-03	--	--	3.1E-02	5.9E-02	--	--	**3.1E-02**	**5.9E-02**
Hexachlorocyclohexane Beta-BHC[C]	0	--	--	9.1E-02	1.7E-01	--	--	1.1E+00	2.0E+00	--	--	9.1E-03	1.7E-02	--	--	1.1E-01	2.0E-01	--	--	**1.1E-01**	**2.0E-01**
Hexachlorocyclohexane Gamma-BHC[C] (Lindane)	0	9.5E-01	--	9.8E-01	1.8E+00	1.1E+01	--	1.2E+01	2.2E+01	2.4E-01	--	9.8E-02	1.8E-01	2.9E+00	--	1.2E+00	2.2E+00	**2.9E+00**	--	**1.2E+00**	**2.2E+00**
Hexachlorocyclopentadiene	0	--	--	4.0E+01	1.1E+03	--	--	4.8E+02	1.3E+04	--	--	4.0E+00	1.1E+02	--	--	4.8E+01	1.3E+03	--	--	**4.8E+01**	**1.3E+03**
Hexachloroethane[C]	0	--	--	1.4E+01	3.3E+01	--	--	1.7E+02	4.0E+02	--	--	1.4E+00	3.3E+00	--	--	1.7E+01	4.0E+01	--	--	**1.7E+01**	**4.0E+01**
Hydrogen Sulfide	0	--	2.0E+00	--	--	--	2.4E+01	--	--	--	5.0E-01	--	--	--	6.0E+00	--	--	--	**6.0E+00**	--	--
Indeno (1,2,3-cd) pyrene [C]	0	--	--	3.8E-02	1.8E-01	--	--	4.6E-01	2.2E+00	--	--	3.8E-03	1.8E-02	--	--	4.6E-02	2.2E-01	--	--	**4.6E-02**	**2.2E-01**
Iron	0	--	--	3.0E+02	--	--	--	3.6E+03	--	--	--	3.0E+01	--	--	--	3.6E+02	--	--	--	**3.6E+02**	--
Isophorone[C]	0	--	--	3.5E+02	9.6E+03	--	--	4.2E+03	1.2E+05	--	--	3.5E+01	9.6E+02	--	--	4.2E+02	1.2E+04	--	--	**4.2E+02**	**1.2E+04**
Kepone	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	**0.0E+00**	--	--
Lead	0	2.0E+01	2.3E+00	1.5E+01	--	2.4E+02	2.8E+01	1.8E+02	--	5.1E+00	5.8E-01	1.5E+00	--	6.1E+01	6.9E+00	1.8E+01	--	**6.1E+01**	**6.9E+00**	**1.8E+01**	--
Malathion	0	--	1.0E-01	--	--	--	1.2E+00	--	--	--	2.5E-02	--	--	--	3.0E-01	--	--	--	**3.0E-01**	--	--
Manganese	0	--	--	5.0E+01	--	--	--	6.0E+02	--	--	--	5.0E+00	--	--	--	6.0E+01	--	--	--	**6.0E+01**	--
Mercury	0	1.4E+00	7.7E-01	--	--	1.7E+01	9.2E+00	--	--	3.5E-01	1.9E-01	--	--	4.2E+00	2.3E+00	--	--	**4.2E+00**	**2.3E+00**	--	--
Methyl Bromide	0	--	--	4.7E+01	1.5E+03	--	--	5.6E+02	1.8E+04	--	--	4.7E+00	1.5E+02	--	--	5.6E+01	1.8E+03	--	--	**5.6E+01**	**1.8E+03**
Methylene Chloride [C]	0	--	--	4.6E+01	5.9E+03	--	--	5.5E+02	7.1E+04	--	--	4.6E+00	5.9E+02	--	--	5.5E+01	7.1E+03	--	--	**5.5E+01**	**7.1E+03**
Methoxychlor	0	--	3.0E-02	1.0E+02	--	--	3.6E-01	1.2E+03	--	--	7.5E-03	1.0E+01	--	--	9.0E-02	1.2E+02	--	--	**9.0E-02**	**1.2E+02**	--
Mirex	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	**0.0E+00**	--	--
Nickel	0	5.6E+01	6.3E+00	6.1E+02	4.6E+03	6.8E+02	7.5E+01	7.3E+03	5.5E+04	1.4E+01	1.6E+00	6.1E+01	4.6E+02	1.7E+02	1.9E+01	7.3E+02	5.5E+03	**1.7E+02**	**1.9E+01**	**7.3E+02**	**5.5E+03**
Nitrate (as N)	0	--	--	1.0E+04	--	--	--	1.2E+05	--	--	--	1.0E+03	--	--	--	1.2E+04	--	--	--	**1.2E+04**	--
Nitrobenzene	0	--	--	1.7E+01	6.9E+02	--	--	2.0E+02	8.3E+03	--	--	1.7E+00	6.9E+01	--	--	2.0E+01	8.3E+02	--	--	**2.0E+01**	**8.3E+02**
N-Nitrosodimethylamine[C]	0	--	--	6.9E-03	3.0E+01	--	--	8.3E-02	3.6E+02	--	--	6.9E-04	3.0E+00	--	--	8.3E-03	3.6E+01	--	--	**8.3E-03**	**3.6E+01**
N-Nitrosodiphenylamine[C]	0	--	--	3.3E+01	6.0E+01	--	--	4.0E+02	7.2E+02	--	--	3.3E+00	6.0E+00	--	--	4.0E+01	7.2E+01	--	--	**4.0E+01**	**7.2E+01**
N-Nitrosodi-n-propylamine[C]	0	--	--	5.0E-02	5.1E+00	--	--	6.0E-01	6.1E+01	--	--	5.0E-03	5.1E-01	--	--	6.0E-02	6.1E+00	--	--	**6.0E-02**	**6.1E+00**
Nonylphenol	0	2.8E+01	6.6E+00	--	--	3.4E+02	7.9E+01	--	--	7.0E+00	1.7E+00	--	--	8.4E+01	2.0E+01	--	--	**8.4E+01**	**2.0E+01**	--	--
Parathion	0	6.5E-02	1.3E-02	--	--	7.8E-01	1.6E-01	--	--	1.6E-02	3.3E-03	--	--	2.0E-01	3.9E-02	--	--	**2.0E-01**	**3.9E-02**	--	--
PCB Total[C]	0	--	1.4E-02	6.4E-04	6.4E-04	--	1.7E-01	7.7E-03	7.7E-03	--	3.5E-03	6.4E-05	6.4E-05	--	4.2E-02	7.7E-04	7.7E-04	--	**4.2E-02**	**7.7E-04**	**7.7E-04**
Pentachlorophenol [C]	0	7.7E-03	5.9E-03	2.7E+00	3.0E+01	9.2E-02	7.1E-02	3.2E+01	3.6E+02	1.9E-03	1.5E-03	2.7E-01	3.0E+00	2.3E-02	1.8E-02	3.2E+00	3.6E+01	**2.3E-02**	**1.8E-02**	**3.2E+00**	**3.6E+01**
Phenol	0	--	--	1.0E+04	8.6E+05	--	--	1.2E+05	1.0E+07	--	--	1.0E+03	8.6E+04	--	--	1.2E+04	1.0E+06	--	--	**1.2E+04**	**1.0E+06**
Pyrene	0	--	--	8.3E+02	4.0E+03	--	--	1.0E+04	4.8E+04	--	--	8.3E+01	4.0E+02	--	--	1.0E+03	4.8E+03	--	--	**1.0E+03**	**4.8E+03**
Radionuclides	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Gross Alpha Activity (pCi/L)	0	--	--	1.5E+01	--	--	--	1.8E+02	--	--	--	1.5E+00	--	--	--	1.8E+01	--	--	--	**1.8E+01**	--
Beta and Photon Activity (mrem/yr)	0	--	--	4.0E+00	--	--	--	4.8E+01	--	--	--	4.0E-01	--	--	--	4.8E+00	--	--	--	**4.8E+00**	--
Radium 226 + 228 (pCi/L)	0	--	--	5.0E+00	--	--	--	6.0E+01	--	--	--	5.0E-01	--	--	--	6.0E+00	--	--	--	**6.0E+00**	--
Uranium (ug/l)	0	--	--	3.0E+01	--	--	--	3.6E+02	--	--	--	3.0E+00	--	--	--	3.6E+01	--	--	--	**3.6E+01**	--

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	1.7E+02	4.2E+03	2.4E+02	6.0E+01	2.0E+03	5.0E+04	5.0E+00	1.3E+00	1.7E+01	4.2E+02	6.0E+01	1.5E+01	2.0E+02	5.0E+03	**6.0E+01**	**1.5E+01**	**2.0E+02**	**5.0E+03**
Silver	0	3.2E-01	--	--	--	3.8E+00	--	--	--	7.9E-02	--	--	--	9.5E-01	--	--	--	**9.5E-01**	--	--	--
Sulfate	0	--	--	2.5E+05	--	--	--	3.0E+06	--	--	--	2.5E+04	--	--	--	3.0E+05	--	--	--	**3.0E+05**	--
1,1,2,2-Tetrachloroethane[C]	0	--	--	1.7E+00	4.0E+01	--	--	2.0E+01	4.8E+02	--	--	1.7E-01	4.0E+00	--	--	2.0E+00	4.8E+01	--	--	**2.0E+00**	**4.8E+01**
Tetrachloroethylene[C]	0	--	--	6.9E+00	3.3E+01	--	--	8.3E+01	4.0E+02	--	--	6.9E-01	3.3E+00	--	--	8.3E+00	4.0E+01	--	--	**8.3E+00**	**4.0E+01**
Thallium	0	--	--	2.4E-01	4.7E-01	--	--	2.9E+00	5.6E+00	--	--	2.4E-02	4.7E-02	--	--	2.9E-01	5.6E-01	--	--	**2.9E-01**	**5.6E-01**
Toluene	0	--	--	5.1E+02	6.0E+03	--	--	6.1E+03	7.2E+04	--	--	5.1E+01	6.0E+02	--	--	6.1E+02	7.2E+03	--	--	**6.1E+02**	**7.2E+03**
Total dissolved solids	0	--	--	5.0E+05	--	--	--	6.0E+06	--	--	--	5.0E+04	--	--	--	6.0E+05	--	--	--	**6.0E+05**	--
Toxaphene [C]	0	7.3E-01	2.0E-04	2.8E-03	2.8E-03	8.8E+00	2.4E-03	3.4E-02	3.4E-02	1.8E-01	5.0E-05	2.8E-04	2.8E-04	2.2E+00	6.0E-04	3.4E-03	3.4E-03	**2.2E+00**	**6.0E-04**	**3.4E-03**	**3.4E-03**
Tributyltin	0	4.6E-01	7.2E-02	--	--	5.5E+00	8.6E-01	--	--	1.2E-01	1.8E-02	--	--	1.4E+00	2.2E-01	--	--	**1.4E+00**	**2.2E-01**	--	--
1,2,4-Trichlorobenzene	0	--	--	3.5E+01	7.0E+01	--	--	4.2E+02	8.4E+02	--	--	3.5E+00	7.0E+00	--	--	4.2E+01	8.4E+01	--	--	**4.2E+01**	**8.4E+01**
1,1,2-Trichloroethane[C]	0	--	--	5.9E+00	1.6E+02	--	--	7.1E+01	1.9E+03	--	--	5.9E-01	1.6E+01	--	--	7.1E+00	1.9E+02	--	--	**7.1E+00**	**1.9E+02**
Trichloroethylene [C]	0	--	--	2.5E+01	3.0E+02	--	--	3.0E+02	3.6E+03	--	--	2.5E+00	3.0E+01	--	--	3.0E+01	3.6E+02	--	--	**3.0E+01**	**3.6E+02**
2,4,6-Trichlorophenol [C]	0	--	--	1.4E+01	2.4E+01	--	--	1.7E+02	2.9E+02	--	--	1.4E+00	2.4E+00	--	--	1.7E+01	2.9E+01	--	--	**1.7E+01**	**2.9E+01**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	5.0E+01	--	--	--	6.0E+02	--	--	--	5.0E+00	--	--	--	6.0E+01	--	--	--	**6.0E+01**	--
Vinyl Chloride[C]	0	--	--	2.5E-01	2.4E+01	--	--	3.0E+00	2.9E+02	--	--	2.5E-02	2.4E+00	--	--	3.0E-01	2.9E+01	--	--	**3.0E-01**	**2.9E+01**
Zinc	0	3.6E+01	3.6E+01	7.4E+03	2.6E+04	4.3E+02	4.4E+02	8.9E+04	3.1E+05	9.1E+00	9.1E+00	7.4E+02	2.6E+03	1.1E+02	1.1E+02	8.9E+03	3.1E+04	**1.1E+02**	**1.1E+02**	**8.9E+03**	**3.1E+04**

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
   Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	6.7E+00
Arsenic	1.2E+01
Barium	2.4E+03
Cadmium	6.9E-01
Chromium III	4.3E+01
Chromium VI	1.9E+01
Copper	4.4E+00
Iron	3.6E+02
Lead	4.2E+00
Manganese	6.0E+01
Mercury	1.4E+00
Nickel	1.1E+01
Selenium	9.0E+00
Silver	3.8E-01
Zinc	4.3E+01

Note: do not use QL's lower than the minimum QL's provided in agency guidance

Total Hardness for Motts Run Reservoir

DEQ Ambient Station	Date Collected	Total Hardness Value
3-MOT000.39	05/22/2008 10:35	13
3-MOT000.39	09/18/2008 10:55	17
3-MOT000.39	06/25/2009 10:25	18
3-MOT001.19	09/18/2008 11:00	17
3-MOT001.19	06/25/2009 11:25	17

Average: **16.4** mg/L as CaCO3

Motts Run WTP pH values reported on the Discharge Monitoring Reports

Date	pH value (SU)
November-11	6.2
October-11	6
September-11	6.6
August-11	6.2
July-11	6.2
June-11	6.5
May-11	6.4
April-11	6.4
March-11	6.3
February-11	6.9
January-11	6.7
December-10	6.4
November-10	6.1
October-10	6.6
September-10	6.2
August-10	6.8
July-10	6.1
June-10	6.4
May-10	6.5
April-10	6.6
March-10	6.4
February-10	6.1
January-10	6.6
December-09	6.4
November-09	6.5
October-09	6.3
September-09	6.6
August-09	6.8
July-09	6.6
June-09	6.5
May-09	6.3
April-09	6.8
March-09	6.4
February-09	6.8
January-09	6.5
December-08	6.2
November-08	6.5
October-08	6.1
September-08	6.7
August-08	6.1
July-08	6.6
June-08	6.4
May-08	6.5
April-08	6.6

90th percentile: 6.8

March-08	6.1
February-08	6.4
January-08	6.7
December-07	7.2
November-07	6.4
October-07	6.4
September-07	6.4
August-07	6.7
July-07	6.3
June-07	6.2
May-07	6.6
April-07	6.7
March-07	6.6
February-07	6.7
January-07	6.2
December-06	6.7
November-06	6.5
October-06	6.6
September-06	6.5
August-06	6.9
July-06	6.6
June-06	7.7
May-06	6.5
April-06	6.4
March-06	6.4
February-06	6.5
January-06	6.8
Dec-05	6.7

Motts Run Reservoir Ambient Monitoring pH and Temperature Data

Ambient Station	Collection Date	Depth	DO Probe	Temp Celcius (deg C)	Field Ph (S.U.)
3-MOT000.39	30-Apr-03	0.3	10.1	20.8	7.6
3-MOT000.39	27-May-03	0.3	9.67	19.1	7.6
3-MOT000.39	25-Jun-03	0.3	10.2	26.7	9.1
3-MOT000.39	28-Jul-03	0.3	7.54	29.53	8.54
3-MOT000.39	27-Aug-03	0.3	9.26	28.66	8.68
3-MOT000.39	25-Sep-03	0.3	9.12	22.01	6.86
3-MOT000.39	15-Oct-03	0.3	8.15	18.12	6.38
3-MOT000.39	3-Apr-08	0.3	12.2	12.2	7.1
3-MOT000.39	22-May-08	0.3	9.7	18	7.3
3-MOT000.39	19-Jun-08	0.3	9.8	25.9	8.2
3-MOT000.39	21-Jul-08	0.3	7.8	30.9	7
3-MOT000.39	27-Aug-08	0.3	8.9	26.1	6.9
3-MOT000.39	18-Sep-08	0.3	8	24.4	6.9
3-MOT000.39	9-Oct-08	0.3	8.3	20	7.4
3-MOT000.39	23-Apr-09	0.3	10.2	14.9	7.2
3-MOT000.39	21-May-09	0.3	10.1	20.9	7.5
3-MOT000.39	25-Jun-09	0.3	10.1	28.5	9
3-MOT000.39	30-Jul-09	0.3	7.5	29.2	7.1
3-MOT000.39	27-Aug-09	0.3	7.5	29.4	7.3
3-MOT000.39	24-Sep-09	0.3	8.3	25.4	7.2
3-MOT000.39	22-Oct-09	0.3	8.6	15.1	6.9
3-MOT001.19	28-Jul-03	0.3	8.8	29.29	8.55
3-MOT001.19	27-Aug-03	0.3	10.02	28.91	8.86
3-MOT001.19	25-Sep-03	0.3	8.66	22.22	6.6
3-MOT001.19	15-Oct-03	0.3	8.8	18.5	6.69
3-MOT001.19	25-Jun-09	0.3	10.2	28.7	8.9
3-MOT001.19	27-Aug-09	0.3	7.6	29.3	7.2
		90th Percentile Values:		**29.34**	**8.876**

Results of Mixing Zone Study

Prepared for:

Motts Run Water Treatment Plant
13000 Trench Hill Lane
Fredericksburg, VA

Prepared by:

Olver Laboratories, Inc.
1116 South Main Street, Suite 200
Blacksburg, VA 24060

April 25, 2002

Job No. 60180

Attachment 8

I. Introduction

The Motts Run Water Treatment Plant is a publicly owned and operated facility that provides potable water for domestic, commercial, and industrial use in Spotsylvania County, Virginia. As part of its normal day to day operations, the Plant generates a wastewater stream that is intermittently discharged to the Motts Run Reservoir. This discharge is regulated under VPDES Permit No. VA0089460, issued to this facility by the Virginia Department of Environmental Quality (DEQ) on July 1, 1997. To support reissuance of this facility's VPDES Permit, Olver Laboratories, Inc. (Olver Labs) was retained to conduct a mixing zone study designed to provide information concerning the dimensions of the zone of initial dilution (ZID), as well as the extent to which the wastewater stream is diluted as it mixes with Motts Run Reservoir water. The mixing zone study was performed on April 16, 2002 by Olver Labs personnel, with the assistance of Motts Run Water Treatment staff members. The results of the study are presented in the report that follows.

II. Technical Approach

A. Overview

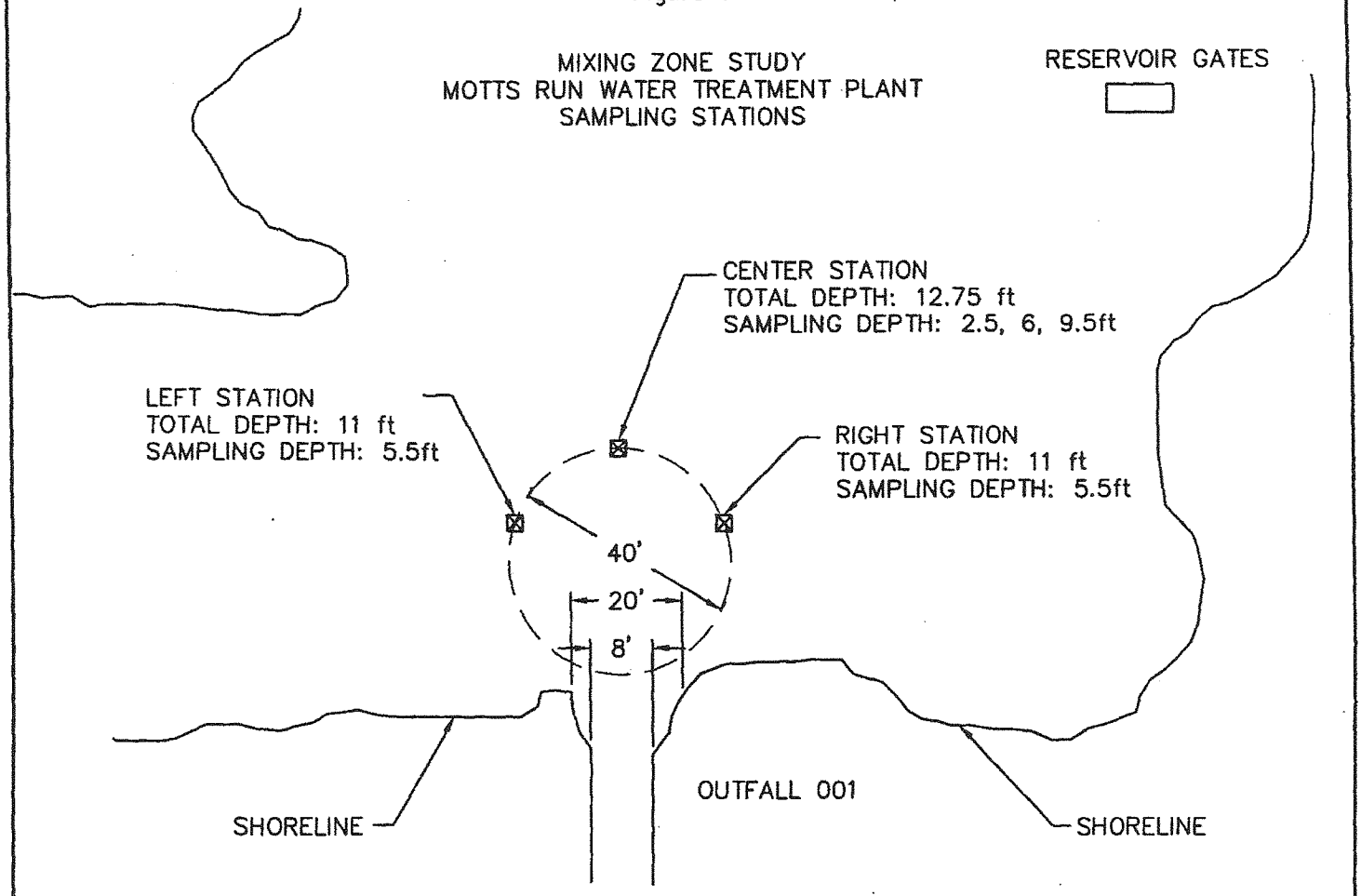
The mixing zone study was performed using dye tracer techniques. The dye of choice was Rhodamine, which was obtained as a 20% solution in water from Crompton & Knowles Colors, Inc.. It was conveniently introduced into what would become the wastewater stream by adding it to the holding tank that is used to collect the wastewater prior to discharge. To facilitate mixing, the concentrated dye solution was added to the

contents of the holding tank as the tank was being filled with filter backwash wastewater. Once full, the contents were held for an additional 1.5 hours to allow for near complete mixing.

The dye was added to the tank in an amount that was calculated to yield a final concentration of approximately 5 ppm. Following standard operating procedures, the contents of the holding tank were discharged to the reservoir through Outfall 001. The total volume discharged measured 70,000 gallons, over a duration of approximately one hour.

To monitor the mixing of the dye-containing wastewater as it was being discharged to the reservoir, three sampling stations were installed. Each consisted of a metal rod driven into the bed of the reservoir along the circumference of a circle having a diameter of 40 feet (See Figure 1 for details). Based on observations made during a "dummy run" (i.e., no dye added), the main vector of the discharge was in a direction that coincided with the centerline of the discharge channel. Therefore, the primary sampling station was located on this centerline at a distance of 40 feet from the point of discharge. Since the main force of the discharge was in the direction of this station, it was anticipated that measurements taken at this station would reflect worst case conditions. The two remaining sampling stations were located at a distance of approximately 12 feet to either side of the central station, along the circumference of the 40 foot circle. These stations were intended to yield a measure of the extent of dilution in the two (2) lateral dimensions.

Figure 1



SCALE: NONE
JOB NO.: 60180

04/25/02

OI VFR

To retrieve samples from the three (3) stations, Bevline® tubing of sufficient length to reach the shore was attached to each of the metal rods. At the central station, three (3) such lengths of tubing were attached such that one was configured to collect samples from 2.5 feet below the surface, a second from a depth of 6.0 feet below the surface, and the third from a depth of 9.5 feet below the surface. At each of the two lateral stations, one length of tubing was attached for purposes of collecting mid-depth samples which, at each of these stations, was determined to be 5.5 feet below surface.

Peristaltic pumps were used to convey samples to shore where they were analyzed for dye content using an Aquafluor™ fluorometer manufactured by Turner Designs. Readings were taken from each of the five monitoring points at intervals ranging from one to five minutes apart.

B. **Study Details**

1. The study was performed on Tuesday, April 16, 2002, beginning with the addition of dye to the holding tank at approximately 8:20 a.m., and ending with site clean-up and departure at approximately 1:15 p.m. The discharge event proper began at 10:25 a.m. and ended at 11:30 a.m. From plant operating records, a total of 70,000 gallons of wastewater was released during the discharge event. The corresponding flow rate, therefore, was on the order of 1,080 gallons per minute.

2. Weather conditions over the course of the event were as follows: sunny; dry; light or no winds; temperatures in the 80s, approaching 90° at mid-day.

3. A filter backwash event was initiated shortly after 8:00 a.m. to generate the wastewater to be released during the discharge event. The filter backwash began to enter the holding tank at approximately 8:20 a.m., at which time the concentrated dye solution was poured into the tank at the wastewater entrance point. Turbulence created as the filter backwash wastewater stream entered the tank served to promote mixing of the dye with the wastewater. In all, 2.5 gallons of a 20%

solution of the dye was added. Given a final tank volume of approximately 100,000 gallons, this was sufficient to yield a dye concentration of 5ppm in the discharge stream.

4. The contents of the holding tank – once full – were held for approximately 1.5 hours, to allow for solids to settle, and to provide additional time for mixing. Prior to the discharge, samples of the dye-containing wastewater were collected from both ends of the tank, and from a central location, then analyzed for dye content using the Turner Designs fluorometer. The three readings, in ppm, were 5.00, 4.50, and 5.60 which, when averaged, yield a value of 5.03 as the initial dye concentration in the wastewater stream prior to discharge.

5. The zone of initial dilution (ZID) was defined as a circular section of the reservoir, 40 feet in diameter, at the mouth of the discharge channel. Based on a depth profile, the floor of the reservoir slopes downward in a linear fashion such that the depth at a point diametrically opposed to, and 40 feet from the discharge point, equals 12.75 feet. Given these dimensions, the volume of the circular section equals 60,000 gallons.

III. Results

A. Observations

At this site, wastewater is conveyed by gravity flow to the reservoir by a gently sloping linear drainage channel lined with rip rap. The wastewater stream exits the channel and enters the reservoir in a direction that is perpendicular to the shoreline. When the wastewater was initially released from the holding tank, it was observed to cascade down the drainage channel at a relatively rapid rate. As it entered the reservoir, there appeared to be a degree of mixing introduced by the force of flow over the irregular surface of the submerged rip rap that extended into the reservoir at the point of entry.

As the discharge continued, the dye plume was observed to migrate in a straight line directly toward the central sampling station. With increasing distance from the shoreline, there was evidence of dispersion

sharp increase in the) concentration occurred approxim ly 10 minutes after the discharge had been initiated. Thereafter, following a brief decline, the concentration remained relatively steady, with values ranging from 2.0 to 2.8 ppm for the duration of the discharge. At the conclusion of the discharge, the concentrations fell rapidly, and reached zero one hour later. The average concentration at this point while the discharge was occurring (as determined from the 12 values recorded from 10:35 a.m. to 11:22 a.m.) was 2.43 ppm. Overall, the measurements taken at this location are entirely consistent with the observations discussed previously; i.e., the force of the discharge created a flow vector in the direction of the central sampling station that lasted for the duration of the discharge, then dissipated rapidly at the conclusion of the discharge.

At the central mid-depth location (Figure 3), as well as at the bottom central location (Figure 4), little or no dye was detected at any

time. This suggests a buoyant discharge for which initial mixing takes place primarily near the surface of the reservoir.

The results for the two lateral sampling locations (Figures 5 and 6) tend to mirror one another. At approximately 11:00 a.m. in both cases (35 minutes after the beginning of the discharge), a transient spike in the dye concentration was detected at both locations. At the left station, the maximum recorded value was 0.398 ppm, while at the right station the maximum was 0.089 ppm. Thereafter, the concentrations fell towards zero until approximately 30 minutes after the completion of the discharge, at which time increases were again observed. It is reasonable to assume that the transient spike observed at the 35 minute mark represents the passage of the front of the dye plume as it expands outward with time, and that the increases after cessation of the discharge represent re-equilibration of the system as a whole in the absence of flow disturbances created by the discharge.

IV. Conceptual Mixing Zone Model

The experimental findings suggest that the primary mixing zone can be modeled as a cylindrical section of the reservoir lying in a horizontal plane near the surface of the reservoir and extending 40 or more feet away from the shoreline. Based on visual observations, the diameter of the cylinder is on the order of four feet. For a 40 foot length, this corresponds to a volume of 503 cubic feet, or 3,760 gallons. Based on measurements taken at the uppermost central

sampling location, the dye concentration within the cylinder averages 2.43 ppm during the discharge, then falls off rapidly at the conclusion of the discharge. Given an initial effluent dye concentration of 5.03 ppm, and an average value during the discharge of 2.43ppm, the corresponding dilution factor becomes:

$$5.03/2.43=2.07$$

At locations outside of the primary mixing cylinder, dye concentrations tended to be less than 0.10 ppm. However, there was a brief excursion to 0.398 ppm at the left lateral station, approximately 35 minutes into the discharge event. Using this as a worst case value, the dilution factor in this case is given as:

$$5.03/0.398=12.6$$

For purposes of planning the experimental phase of this study, the zone of initial dilution was taken to be a vertical cylinder, 40 feet in diameter, with a depth of zero feet at the shoreline, and 12.75 feet at its outermost perimeter. As mentioned previously, the volume of this segment equals 60,000 gallons. The cylindrical subsection that is now being considered as the primary mixing zone occupies (3,760/60,000) x 100 = 6.27% of the total volume. Using this value to calculate a weighted average dilution factor for the area as a whole yields the value shown below:

$$[(0.0627)(2.07) + (0.9373)(12.6)] = 11.9$$

4/24/2007 10:41:59 AM

Facility = Motts Run WTP
Chemical = Total Residual Chlorine
Chronic averaging period = 4
WLAa = 57
WLAc = 33
Q.L. = 100
# samples/mo. = 30
# samples/wk. = 7

Summary of Statistics:

observations = 1
Expected Value = 200
Variance = 14400
C.V. = 0.6
97th percentile daily values = 486.683
97th percentile 4 day average = 332.758
97th percentile 30 day average= 241.210
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 48.2649678737566
Average Weekly limit = 29.4757637141583
Average Monthly LImit = 23.9211395516274

The data are:

200

1/31/2012 8:07:53 AM

Facility = Motts Run WTP
Chemical = Zinc
Chronic averaging period = 4
WLAa = 110
WLAc =
Q.L. = 5
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 5
Expected Value = 3.65648
Variance = 4.81315
C.V. = 0.6
97th percentile daily values = 8.89775
97th percentile 4 day average = 6.08362
97th percentile 30 day average= 4.40991
< Q.L. = 4
Model used = BPJ Assumptions, Type 1 data

No Limit is required for this material

The data are:

7
0
0
0
0

M E M O R A N D U M

DEPARTMENT OF ENVIRONMENTAL QUALITY
Northern Regional Office
13901 Crown Court **Woodbridge, VA 22193** **(703) 583-3800**

SUBJECT: TOXICS MANAGEMENT PROGRAM (TMP) DATA REVIEW
Motts Run Water Treatment Plant (VA0089460)
REVIEWER: Douglas Frasier
DATE: 25 October 2010

PREVIOUS REVIEW: 5 November 2009

DATA REVIEWED:

This review covers the third (3rd) annual acute toxicity tests conducted in September 2010 for Outfall 001.

DISCUSSION:

The results of these toxicity tests along with the results of previous toxicity tests performed with effluent samples collected from Outfall 001 are summarized in Table 1.

The effluent acute toxicity was determined with a 48-hour static *C. dubia* acute test and a 48-hour static *P. promelas* acute test. The tests yielded for both species a LC_{50} of greater than 100% effluent, greater than the instream waste concentration (IWC) of 8.3%; thus meeting the LC_{50} endpoint of 28% effluent as stated in the permit.

The test results indicated that the effluent sample exhibited no acute toxicity to the test organisms.

CONCLUSION:

The acute toxicity tests are valid and the results acceptable. The test results indicated that the effluent sample exhibited no acute toxicity to the test organisms.

BIOMONITORING RESULTS

Motts Run Water Treatment Plant (VA0089460)

Table 1
Summary of Toxicity Test Results for Outfall 001

TEST DATE	TEST TYPE/ ORGANISM	LC_{50} (%)	NOEC (%)	% SURV	IC_{25} (%)	TU_a	TU_c	REMARKS
08/31/00	Acute *C. dubia*	>100		100		< 1		1st quarterly
08/31/00	Acute *P. Promelas*	>100		100		< 1		
08/29/00	Chronic *C. dubia*		100 SR	100			1	
08/29/00	Chronic *P. promelas*		100 S **12.5 G**	85			**8**	
12/14/00	Acute *C. dubia*	**73.89**		25		**1.35**		2nd quarterly
12/14/00	Acute *P. Promelas*	>100		100		< 1		
12/12/00	Chronic *C. dubia*	>100	**50 S** **6.25 R**	100	8.95		**16**	
12/12/00	Chronic *P. promelas*	>100	100 SR	100	>100		1	
03/22/01	Acute *C. dubia*	>100		85		< 1		3rd quarterly
03/22/01	Acute *P. Promelas*	>100		100		< 1		
03/20/01	Chronic *C. dubia*	>100	100 S **25 R**	78	32.2		**4**	
03/20/01	Chronic *P. promelas*	>100	100 SG	98	>100		1	
Permit reissued on 18 July 2002 Dye study shows dilution = 12; or IWC = 8.3 %								
09/25/02	Acute *C. dubia*	>100		100		< 1		1st Annual
09/25/02	Acute *P. Promelas*	>100		95		< 1		
12/11/03	Acute *C. dubia*	>100		95		< 1		2nd Annual
12/11/03	Acute *P. Promelas*	>100		95		< 1		
12/15/04	Acute *C. dubia*	>100		100		< 1		3rd Annual
12/15/04	Acute *P. Promelas*	>100		100		< 1		
12/29/05	Acute *C. dubia*	>100		100		< 1		4th Annual
12/29/05	Acute *P. Promelas*	>100		100		< 1		
01/24/07	Acute *C. dubia*	>100		100		< 1		5th Annual
01/24/07	Acute *P. Promelas*	>100		100		< 1		
Permit reissued on 18 July 2007								
08/07/08	Acute *C. dubia*	>100		100		< 1		1st Annual
08/07/08	Acute *P. Promelas*	>100		100		< 1		
09/09/09	Acute *C. dubia*	>100		100		< 1		2nd Annual
09/09/09	Acute *P. Promelas*	>100		100		< 1		
09/01/10	Acute *C. dubia*	>100		100		< 1		3rd Annual
09/01/10	Acute *P. Promelas*	>100		100		< 1		

FOOTNOTES:

A **bold** faced LC_{50} or NOEC value indicates that the test failed the criteria.
LC50 at 48 hours

ABBREVIATIONS:

S – Survival; R – Reproduction; G – Growth
% SURV – Percent survival in 100% effluent
TUa – acute toxicity unit; TUc – chronic toxicity unit

September 9, 2011

Mr. Kelvin Jenkins
County of Spotsylvania
Motts Run Water Treatment Plant
13000 Trench Hill Lane
Fredericksburg, VA 22407

Re: Toxicity Testing Results, Final Effluent; VPDES Permit No.: VA0089460; CHA Project Number: 22052

Dear Mr. Jenkins:

Enclosed are three (3) copies of the report which describes the performance and the results of the acute toxicity testing performed for the Motts Run Water Treatment Plant. Testing consisted of 48-hour static acute fathead minnow (*Pimephales promelas*) and *Ceriodaphnia dubia* tests using a composite effluent sample from Outfall 001 collected on August 30, 2011. The enclosed report includes results summary pages, raw data, statistical analyses, and chain of custody documentation. CHA Consulting, Inc. has reviewed the report and approved the test methods and results.

The results of this testing indicate that the effluent did not exhibit acute toxicity effects on the test organisms. The toxicity end-points for both tests are summarized as follows:

Testing Dates	Testing Performed	Toxicity End-Point (% Effluent)	
		48-Hour LC_{50}	TU_a (100/ LC_{50})
8/31/11 – 9/2/11	48-Hour Acute *Pimephales promelas*	> 100%	< 1.0
8/31/11 – 9/2/11	48-Hour Acute *Ceriodaphnia dubia*	> 100%	< 1.0

LC_{50}: Median lethal concentration. TU_a: Acute toxicity unit (100/ LC_{50}).

We remain available to discuss the test results or report at your convenience. As always, please do not hesitate to contact me should you have any questions, comments, or additional needs.

Very truly yours.

R. Lawrence Hoffman
Vice President

RLH/egl
Enclosures

1116 South Main Street, Blacksburg, VA 24060-5548
T 540.552.5548 • F 540.552.5577 • www.chacompanies.com

Public Notice – Environmental Permit

PURPOSE OF NOTICE: To seek public comment on a draft permit from the Department of Environmental Quality that will allow the release of treated industrial wastewater into a water body in Spotsylvania County, Virginia.

PUBLIC COMMENT PERIOD: May 4, 2012 to 5:00 p.m. on June 4, 2012

PERMIT NAME: Virginia Pollutant Discharge Elimination System Permit – Wastewater issued by DEQ, under the authority of the State Water Control Board

APPLICANT NAME, ADDRESS AND PERMIT NUMBER: Spotsylvania County, 600 Hudgins Rd, Fredericksburg, VA 22408, VA0089460

NAME AND ADDRESS OF FACILITY: Motts Run WTP, 13000 Trench Hill Lane, Fredericksburg, VA 22407
This facility is an Exemplary Environmental Enterprise participant in Virginia's Environmental Excellence Program.

PROJECT DESCRIPTION: Spotsylvania County has applied for a reissuance of a permit for the public Motts Run WTP. The applicant proposes to release treated industrial wastewaters and storm water at a rate of 0.69 million gallons per day into a water body. The sludge will be disposed by sanitary sewer to the Fredericksburg WWTP. The facility proposes to release the treated industrial wastewaters and storm water in the Motts Run Reservoir in Spotsylvania County in the Rappahannock watershed. A watershed is the land area drained by a river and its incoming streams. The permit will limit the following pollutants to amounts that protect water quality: pH, Total Suspended Solids, and Total Residual Chlorine. Monitoring is included for Dissolved Manganese.

HOW TO COMMENT AND/OR REQUEST A PUBLIC HEARING: DEQ accepts comments and requests for public hearing by e-mail, fax or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all persons represented by the commenter/requester. A request for public hearing must also include: 1) The reason why a public hearing is requested. 2) A brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requestor, including how and to what extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit with suggested revisions. A public hearing may be held, including another comment period, if public response is significant, based on individual requests for a public hearing, and there are substantial, disputed issues relevant to the permit.

CONTACT FOR PUBLIC COMMENTS, DOCUMENT REQUESTS AND ADDITIONAL INFORMATION: The public may review the documents at the DEQ-Northern Regional Office by appointment, or may request electronic copies of the draft permit and fact sheet.
Name: Alison Thompson
Address: DEQ-Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193
Phone: (703) 583-3834 E-mail: Alison.Thompson@deq.virginia.gov Fax: (703) 583-3821

Revised 2/2003

State "Transmittal Checklist" to Assist in Targeting
Municipal and Industrial Individual NPDES Draft Permits for Review

Part I. State Draft Permit Submission Checklist

In accordance with the MOA established between the Commonwealth of Virginia and the United States Environmental Protection Agency, Region III, the Commonwealth submits the following draft National Pollutant Discharge Elimination System (NPDES) permit for Agency review and concurrence.

Facility Name:	Motts Run WTP
NPDES Permit Number:	VA0089460
Permit Writer Name:	Alison Thompson
Date:	2/27/2012

Major [ ] **Minor** [X] **Industrial** [X] **Municipal** [ ]

I.A. Draft Permit Package Submittal Includes:	**Yes**	**No**	**N/A**
1. Permit Application?	X		
2. Complete Draft Permit (for renewal or first time permit – entire permit, including boilerplate information)?	X		
3. Copy of Public Notice?	X		
4. Complete Fact Sheet?	X		
5. A Priority Pollutant Screening to determine parameters of concern?	X		
6. A Reasonable Potential analysis showing calculated WQBELs?	X		
7. Dissolved Oxygen calculations?			X
8. Whole Effluent Toxicity Test summary and analysis?	X		
9. Permit Rating Sheet for new or modified industrial facilities?	X		

I.B. Permit/Facility Characteristics	**Yes**	**No**	**N/A**
1. Is this a new, or currently unpermitted facility?		X	
2. Are all permissible outfalls (including combined sewer overflow points, non-process water and storm water) from the facility properly identified and authorized in the permit?	X		
3. Does the fact sheet **or** permit contain a description of the wastewater treatment process?	X		
4. Does the review of PCS/DMR data for at least the last 3 years indicate significant non-compliance with the existing permit?		X	
5. Has there been any change in streamflow characteristics since the last permit was developed?		X	
6. Does the permit allow the discharge of new or increased loadings of any pollutants?		X	
7. Does the fact sheet **or** permit provide a description of the receiving water body(s) to which the facility discharges, including information on low/critical flow conditions and designated/existing uses?	X		
8. Does the facility discharge to a 303(d) listed water?	X		
a. Has a TMDL been developed and approved by EPA for the impaired water?		X	
b. Does the record indicate that the TMDL development is on the State priority list and will most likely be developed within the life of the permit?	X		
c. Does the facility discharge a pollutant of concern identified in the TMDL or 303(d) listed water?		X	
9. Have any limits been removed, or are any limits less stringent, than those in the current permit?		X	
10. Does the permit authorize discharges of storm water?		X	

I.B. Permit/Facility Characteristics – cont.	Yes	No	N/A
11. Has the facility substantially enlarged or altered its operation or substantially increased its flow or production?		X	
12. Are there any production-based, technology-based effluent limits in the permit?	X		
13. Do any water quality-based effluent limit calculations differ from the State's standard policies or procedures?		X	
14. Are any WQBELs based on an interpretation of narrative criteria?		X	
15. Does the permit incorporate any variances or other exceptions to the State's standards or regulations?		X	
16. Does the permit contain a compliance schedule for any limit or condition?		X	
17. Is there a potential impact to endangered/threatened species or their habitat by the facility's discharge(s)?		X	
18. Have impacts from the discharge(s) at downstream potable water supplies been evaluated?	X		
19. Is there any indication that there is significant public interest in the permit action proposed for this facility?		X	
20. Have previous permit, application, and fact sheet been examined?	X		

Part II. NPDES Draft Permit Checklist

Region III NPDES Permit Quality Review Checklist – For Non-Municipals
(To be completed and included in the record for all non-POTWs)

II.A. Permit Cover Page/Administration	Yes	No	N/A
1. Does the fact sheet **or** permit describe the physical location of the facility, including latitude and longitude (not necessarily on permit cover page)?	X		
2. Does the permit contain specific authorization-to-discharge information (from where to where, by whom)?	X		

II.B. Effluent Limits – General Elements	Yes	No	N/A
1. Does the fact sheet describe the basis of final limits in the permit (e.g., that a comparison of technology and water quality-based limits was performed, and the most stringent limit selected)?	X		
2. Does the fact sheet discuss whether "antibacksliding" provisions were met for any limits that are less stringent than those in the previous NPDES permit?	X		

II.C. Technology-Based Effluent Limits (Effluent Guidelines & BPJ)	Yes	No	N/A
1. Is the facility subject to a national effluent limitations guideline (ELG)?		X	
a. If yes, does the record adequately document the categorization process, including an evaluation of whether the facility is a new source or an existing source?			X
b. If no, does the record indicate that a technology-based analysis based on Best Professional Judgement (BPJ) was used for all pollutants of concern discharged at treatable concentrations?	X		
2. For all limits developed based on BPJ, does the record indicate that the limits are consistent with the criteria established at 40 CFR 125.3(d)?	X		
3. Does the fact sheet adequately document the calculations used to develop both ELG and /or BPJ technology-based effluent limits?	X		
4. For all limits that are based on production or flow, does the record indicate that the calculations are based on a "reasonable measure of ACTUAL production" for the facility (not design)?			X
5. Does the permit contain "tiered" limits that reflect projected increases in production or flow?		X	
a. If yes, does the permit require the facility to notify the permitting authority when alternate levels of production or flow are attained?			X
6. Are technology-based permit limits expressed in appropriate units of measure (e.g., concentration, mass, SU)?	X		
7. Are all technology-based limits expressed in terms of both maximum daily, weekly average, and/or monthly average limits?	X		
8. Are any final limits less stringent than required by applicable effluent limitations guidelines or BPJ?		X	

II.D. Water Quality-Based Effluent Limits	Yes	No	N/A
1. Does the permit include appropriate limitations consistent with 40 CFR 122.44(d) covering State narrative and numeric criteria for water quality?	X		
2. Does the record indicate that any WQBELs were derived from a completed and EPA approved TMDL?		X	
3. Does the fact sheet provide effluent characteristics for each outfall?	X		
4. Does the fact sheet document that a "reasonable potential" evaluation was performed?	X		
a. If yes, does the fact sheet indicate that the "reasonable potential" evaluation was performed in accordance with the State's approved procedures?	X		
b. Does the fact sheet describe the basis for allowing or disallowing in-stream dilution or a mixing zone?	X		

II.D. Water Quality-Based Effluent Limits – cont.	Yes	No	N/A
c. Does the fact sheet present WLA calculation procedures for all pollutants that were found to have "reasonable potential"?	X		
d. Does the fact sheet indicate that the "reasonable potential" and WLA calculations accounted for contributions from upstream sources (i.e., do calculations include ambient/background concentrations where data are available)?	X		
e. Does the permit contain numeric effluent limits for all pollutants for which "reasonable potential" was determined?	X		
5. Are all final WQBELs in the permit consistent with the justification and/or documentation provided in the fact sheet?	X		
6. For all final WQBELs, are BOTH long-term (e.g., average monthly) AND short-term (e.g., maximum daily, weekly average, instantaneous) effluent limits established?	X		
7. Are WQBELs expressed in the permit using appropriate units of measure (e.g., mass, concentration)?	X		
8. Does the fact sheet indicate that an "antidegradation" review was performed in accordance with the State's approved antidegradation policy?	X		

II.E. Monitoring and Reporting Requirements	Yes	No	N/A
1. Does the permit require at least annual monitoring for all limited parameters?	X		
a. If no, does the fact sheet indicate that the facility applied for and was granted a monitoring waiver, AND, does the permit specifically incorporate this waiver?			
2. Does the permit identify the physical location where monitoring is to be performed for each outfall?	X		
3. Does the permit require testing for Whole Effluent Toxicity in accordance with the State's standard practices?		X	

II.F. Special Conditions	Yes	No	N/A
1. Does the permit require development and implementation of a Best Management Practices (BMP) plan or site-specific BMPs?		X	
a. If yes, does the permit adequately incorporate and require compliance with the BMPs?			X
2. If the permit contains compliance schedule(s), are they consistent with statutory and regulatory deadlines and requirements?			X
3. Are other special conditions (e.g., ambient sampling, mixing studies, TIE/TRE, BMPs, special studies) consistent with CWA and NPDES regulations?	X		

II.G. Standard Conditions	Yes	No	N/A
1. Does the **permit** contain all 40 CFR 122.41 standard conditions or the State equivalent (or more stringent) conditions?	X		

List of Standard Conditions – 40 CFR 122.41

Duty to comply	Property rights	Reporting Requirements
Duty to reapply	Duty to provide information	Planned change
Need to halt or reduce activity not a defense	Inspections and entry	Anticipated noncompliance
	Monitoring and records	Transfers
Duty to mitigate	Signatory requirement	Monitoring reports
Proper O & M	Bypass	Compliance schedules
Permit actions	Upset	24-Hour reporting
		Other non-compliance

2. Does the permit contain the additional standard condition (or the State equivalent or more stringent conditions) for existing non-municipal dischargers regarding pollutant notification levels [40 CFR 122.42(a)]?	X		

Part III. Signature Page

Based on a review of the data and other information submitted by the permit applicant, and the draft permit and other administrative records generated by the Department/Division and/or made available to the Department/Division, the information provided on this checklist is accurate and complete, to the best of my knowledge.

Name	Alison Thompson
Title	Water Permits Technical Reviewer
Signature	
Date	2/27/12